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Proceedings
of the
1929 Annual Conference

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November 11–13, 1929

Co-operating with

Missouri
State Board of Health
State Bureau of Mines
State Department of Labor and Industrial Inspection
Missouri Commission for the Blind
Missouri Asssociation for the Blind
St. Louis Public Schools
American Legion
Ophthalmic Section of the St. Louis Medical Society
Missouri Social Hygiene Association
and
Sight-saving Class Supervisors and Teachers

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* Because of the informality of the luncheon meetings, the National Society for the Prevention of Blindness, in the interests of economy, is omitting their publication in this volume.

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† Since the proceedings of this meeting are to appear in forthcoming issues of *Hospital Social Service* the National Society for the Prevention of Blindness will omit the publishing of them as part of these Proceedings.

‡ Since this paper appeared in the *American Journal of Ophthalmology*, Vol. 13, No. 2, February, 1930, it is not printed here.

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† This section is published separately as an issue of the *Sight-Saving Class Exchange*, No. 28, December, 1929, and can be secured from the National Society for the Prevention of Blindness upon request.

Co-operative Relationship in the Field of Prevention of Blindness

Lewis H. Carris, *Chairman*

CO-OPERATIVE RELATIONSHIP IN THE FIELD OF PREVENTION OF BLINDNESS

LEWIS H. CARRIS, Chairman

CHAIRMAN CARRIS: It has been decided that the formal welcome and opening of this convention will take place at the luncheon today at twelve-thirty, so I am not going to burden you with any statements about my pleasure, and the pleasure of my fellow-workers, in being here.

This session this morning deals with the official and volunteer agencies interested directly in the prevention of blindness. I recently sent to the discussants, and those who are to read papers, a brief statement prepared hurriedly which attempted to classify more or less the various agencies concerned with the prevention of blindness.

The work for the prevention of blindness differs from most other health agency activities. If we are to conserve sight we must deal with a large number of official and volunteer agencies in which the major activity may not be that of conserving sight but in which conserving sight may be one of the minor undertakings. This morning we deal with the official and volunteer agencies; and perhaps in order that the meeting may have the same slant on the program that we have given to the speakers, I will read the statement which was prepared.

I. Voluntary Associations Devoted Exclusively to the Prevention of Blindness.—The National Society for the Prevention of Blindness attempts to set up a co-operative relationship with all official and voluntary agencies concerned with the prevention of blindness. Theoretically, it would seem desirable that there should be in each state voluntary organizations having the same aims and objects as the National Society but which, being nearer the field of action, could assume the more immediate responsibility of case work and co-operation with municipal authorities. Actually, however, there are at the present time only two such active voluntary state organizations devoted exclusively to the prevention of blindness; the Illinois Society for the Prevention of Blindness, and the Maryland

Society for the Prevention of Blindness. It is to be hoped that as time goes on similar effective organizations may be formed in other of the more populous centers.

II. Voluntary Associations Doing Work for the Blind and the Prevention of Blindness.—Any association carrying on welfare work for the blind must of necessity also be concerned with the prevention of blindness, inasmuch as it is a fundamental principle that no one should remain permanently blind when medical assistance may restore sight. But in addition to this inherent function, many associations for the blind also have departments specifically concerned with the prevention of blindness. Two familiar examples of this type of organization are the Missouri Association for the Blind and the Pennsylvania Association for the Blind.

You will note in my paper I am dealing with state agencies and not including local associations for the blind. If we attempted to catalogue those it would confuse, perhaps, the morning's discussion but I want those people who are here who represent local city or county associations for the blind, who are carrying on prevention activities, to understand why their names are not catalogued in this particular paper.

I may say in passing that I have known of a number of agencies for the care of the blind who have also carried the heading "Prevention of Blindness." I think that any agency for the care of the blind which carries that heading, "Prevention of Blindness" should really engage in some specific and definite activities. We hope they may be so organized but not until they are to undertake specific work for the prevention of blindness.

III. State Commissions for the Blind.—These are official agencies carrying out state laws concerned with the welfare of the blind which also have been given by legislative enactment certain more or less definite responsibilities in the field of prevention. Among the state commissions for the blind which have undertaken prevention work are:

Connecticut State Board of Education for the Blind
Iowa Commission for the Blind
Massachusetts Commission for the Blind
Missouri Commission for the Blind
New York State Commission for the Blind
Ohio Commission for the Blind
Pennsylvania State Council for the Blind
Virginia Commission for the Blind

Now I understand, of course, that there are certain other commissions where they are doing some prevention work, but I have included in this outline only those commissions where we have first-hand knowledge of a serious undertaking in the field of prevention.

IV. State Boards of Health.—While relatively few state boards of health have a distinct department for the prevention of blindness, every state board of health, by the very nature of its work, is an official agency having a very large responsibility for the prevention of blindness in certain of its phases, as for example, ophthalmia neonatorum, blindness resulting from venereal disease and, in some states, blindness resulting from trachoma.

V. State Departments of Labor and State Compensation Boards.—These bureaus have a direct concern in the prevention of blindness from accidents and from industrial diseases.

VI. State Departments of Education.—Inasmuch as eyesight is the principal avenue of approach to the mind, all agencies concerned with the education of children have necessarily a large responsibility for the conservation of vision.

This brief outline of the voluntary and official agencies concerned with the conservation of vision reveals the necessity for understanding the work carried on by these various agencies and discovering the limits of their responsibilities as well as the possibilities for expanding their activities. The National Society is anxious to co-operate and work with each of these agencies and to assist them in every way possible to the end that their work may be done most effectively.

There are present representatives from each type of organized activity and we hope to secure from the various participants in this conference the following information: first, a brief résumé of the work now being carried on in a particular state; second, a statement of the desirable activities for the type of organizations which the speaker represents.

The following are certain questions which should at some time be answered as definitely as possible:

Is the work for prevention of blindness an activity entirely distinct from welfare work for the blind?

If not, how can the common activities be defined?

To what extent is there duplication of work in any state?

What efforts are being made to correlate in the state the various activities for the conservation of vision?

Does the combination of work for the blind and prevention of blindness arouse confusion as to the latter?

Should there be local or regional volunteer societies for the prevention of blindness?

What state legislation for prevention of blindness should be advocated?

It is not probable that any of these questions can be settled today. Enough will be accomplished, however, if they are briefly discussed. Co-operation and understanding are the two key words to success in the prevention program, and the National Society for the Prevention of Blindness feels that its principal work is to give aid to this end.

We are fortunate this morning in having a list of speakers who can speak with authority on these various topics. The first speaker deserves a special introduction. It is his first meeting with us, and he has just been selected for a responsible state position.

Mr. S. Mervyn Sinclair, chairman of the Pennsylvania State Council for the Blind since its inception in 1925, has just been appointed Executive Director of the Pennsylvania State Council for the Blind, a position left vacant by the resignation of Mrs. Mary Dranga Campbell, who became the Executive Director of the Missouri Commission for the Blind on October 1, 1929.

Since his appointment as a member of the Council he has made a definite study of work for the blind not only in this country but in England, Scotland, Ireland and France. As chairman of the Council for the Blind, he was in intimate contact with every detail of its organization and program, and is well qualified to carry on its work. I have great pleasure in introducing Mr. Sinclair who will speak for the Pennsylvania Council for the Blind of Harrisburg.

The Preventive Work of the Pennsylvania State Council for the Blind

S. Mervyn Sinclair
Executive Director, Pennsylvania State Council for the Blind, Harrisburg, Pa.

I appreciate very much, Mr. Carris, your telling our friends here just how my connection came about with work for the blind, with the State Council for the Blind. While I am here today as the Executive Director of the State Council, I really came as the Chairman of that Council and rather in that capacity expect to talk to you for this brief five minutes.

The Council for the Blind in Pennsylvania, as you probably know, is the result of the findings of the Commission appointed there by Governor Pinchot in 1923 to study conditions among the blind in that State. That Commission consisted very largely of persons interested actively in work for the blind, together with a few other socially minded people who could guide, perhaps, the thoughts of the active workers along lines which would be acceptable to the administration in any suggestions which might come out of their study.

The chief suggestion which came out of that study of Governor Pinchot's commission was the organization of a state unit to do work for the blind and also to work definitely for the prevention of blindness.

Unfortunately, in the Act which created the Council, there was a failure to provide anywhere near a sufficient amount of money to do adequately the work which the Council was instructed by the Legislature to do. Our activities, therefore, for the first two years of our operation, were very much limited. We were able to do only some things which were very immediate, but ever since the inception of the Council it has been our most earnest wish that we could begin as early as possible developing the activities under our responsibility for prevention.

The Council for the Blind is an administrative board in the Department of Welfare with certain advisory and supervisory powers. Having been created almost one hundred years after the first active work for the blind began in the State of Pennsylvania, you can well imagine that almost all phases of that work, including some effort for the prevention of blindness, had been developed to a greater or less degree, and coming into the picture as late as we did, it was felt advisable for the Council to keep its hands off any work which was already being capably performed by existing agencies. To that end, the powers of the Council are very largely advisory and supervisory. It is definitely, and very definitely, a co-ordinating body.

In the field of the prevention of blindness, its duty is to learn, first, of all, the work being done by other agencies; to compare that work with the highest standards of such work being done elsewhere in the country; to give information about these higher standards; and to prevent, if possible, overlapping in the efforts of either state or private agencies concerned with conservation of vision.

In the effort to secure co-operation among various state agencies and between state and private agencies, the Council has until very recently had to rely only upon the personal efforts of its various members, and the little time which could be spared by our Executive Director, Mrs. Campbell, from her many other duties.

Two years ago, at a meeting of representative workers for the blind, together with some representative social workers of the State, the Council was advised after considerable discussion to undertake the formation of a department for the prevention of blindness and to engage as the head of that particular department someone who would be capable of carrying on its activities.

This the Council decided to do, and to indicate to you the feeling which it had decided, at a meeting, shortly subsequent to the meeting of which I have just spoken, to rearrange the program then in operation, limiting its activities in order to take up its prevention program. A year and a half ago, the program had further to be modified in order to bring it within the limits of the present 1929–31 biennium.

Just one month ago, or about the time I was asked to come to this Conference, we were able to secure the services of Miss Evelyn M. Carpenter who will be charged from now on with the responsibility of developing a program for the prevention of blindness and conservation of vision for the State Council for the Blind of Pennsylvania.

Chairman Carris: That is a very fine announcement. We always have a period of rejoicing in our offices in New York City when we learn that a state has definitely appointed a capable person who has been given some administrative responsibility for working out this correlation and we were especially pleased with Miss Carpenter's appointment and her visit to our New York offices, not that we have everything to give there but we feel we have something to give and the co-operation we have had with the Pennsylvania Council has from the very start been most cordial and helpful.

I introduced Mr. Sinclair rather formally. If I had attempted to make a biographical speech on all of the people who speak this morning and had given their various degrees and titles, and had attempted to evaluate their professional experience, most of the time would be taken up with introductions.

There is a rather close correlation in many instances between the responsibilities which are put upon a state agency for the care of the blind, the by-product to some extent sometimes, the direct product at other times, in the field of prevention of blindness. Missouri, I think, is an example of the growth of a large prevention department in the State Commission following a very large administrative problem, the administration of the liberal pension law of Missouri.

From the very start, the Commission for the Blind in Missouri has dealt in closest relationship with the medical profession. It has a medical director, a man of more than state reputation in the field of ophthalmology. I am not familiar with his various degrees and professional experience, but I am quite familiar with the work which he is doing. It is with very great pleasure that I introduce Dr. Wiener.

The Preventive Work of the Missouri Commission for the Blind

MEYER WIENER, M.D.
Director of Prevention of Blindness, Missouri Commission for the Blind,
St. Louis, Mo.

Co-operation with organization and individual is highly essential for adequate blind prevention work. This is impossible to effectively consummate without education. Instruction must come by example in definite and concrete form, not only to the person directly concerned but to the association as well. Lack of co-ordination in the work of bodies established for similar aims is always due to want of proper understanding. There should be no friction where there is a single ideal purpose in view. The prevention department of the Missouri Commission for the Blind has this thought uppermost at all times.

Experience seems to indicate that diagnostic and advisory clinics serve best to perform the function of preventing blindness. In holding these clinics it is our aim to cover the state by districts during the year, laying particular stress on the outlying territory where expert ophthalmological service is not easily available. Repeated observation has shown that it is of more practical value to cover a definite territory by grouping a series of clinics in a given neighborhood than to endeavor to cover too large an area and have the work uncompleted. A follow-up with an operative clinic is then arranged after the group has been properly tabulated.

The following figures illustrate of how our prevention department has grown: Eleven clinics have been held from January through October, 1929—with a total attendance of 753. On November 1, 1928, there were 60 prevention cases on file. On November 1, 1929, there were 1,018 cases, not including the last clinic held; 32 eligible applicants for the pension were operated upon, resulting in 25 being disallowed and 7 undetermined; 20 ineligible applicants were operated upon and 40 straight prevention cases; 10 blind pensioners had submitted to operation, four of them being disallowed after operation; two as yet are undecided and four unchanged. There were a total of 137 hospitalization cases, including 27 with no cost to the Commission and 7 who helped to defray the expenses. Thirty-five were sent to the Rolla Trachoma Hospital, more would have been sent had they had room.

The Commission has co-operated with the County Health Units and with the United States Public Health Service, County Medical Health Officers and nurses have shown a keen interest in our clinics and have been an important factor in spreading our educational program.

Trachoma and glaucoma are the chief dragons we must fight. In a survey made by Miss Audrey Hayden and me for the year 1926, of 3,153 blind pensioners in Missouri, 660 were blind from trachoma and 358 were blind, the result of glaucoma. Glaucoma is our especially difficult problem since it is so often not recognized until too late. Three cases of brain tumor have been diagnosed since January, 1929.

The chief obstacle in carrying out our plans for prevention is lack of funds. The prevention department was allotted $40,000 by the last legislature for the biennial period. Many more cases could be cared for if we had more money to defray expenses for travel and hospital care. No charge is made for treatment or operative care by any of the staff of eye physicians, all of whom hold the certificate of the American Board of Ophthalmic Examiners.

The aid lent by the Lions Club through the week of instruction in their annual institute for teachers, has been an inspiring help.

The National Society for the Prevention of Blindness co-operated with us by making available the services of Miss Mildred Smith to the Commission to aid in the establishment of conservation work. In the fall of 1928, Miss Smith spent six weeks of her valuable time with one of our nurses in a tour of the state.

A survey of the Joplin school district was started by our prevention nurse on January 27, 1929, and finished March 15, 1929. A follow up of this work is planned later. We hope to add two additional nurses to our staff in the near future which will enable us to carry out plans for further expansion in diagnostic, advisory and operative clinics, group instruction in schools, and instruction in prevention in industrial plants.

CHAIRMAN CARRIS: We are always glad to receive the reports from the Missouri Commission for the Blind which Dr. Wiener sends us regularly.

May I just take this opportunity to say that the National Society for the Prevention of Blindness has a different relationship to its co-operating agencies from that of many national organizations. We try not to be paternalistic. No reports are required, but I wish to say that we have from practically every agency in the country these voluntary reports which keep us in touch with what is going on.

The national headquarters of the Society are in New York State and most of the staff members are residents of New York State. I suppose it was by virtue of my own residence in New York State that I was chosen as a member of the New York Commission for the Blind some five or six years ago. Of course, as a member of that Commission I am quite proud of the work the New York Commission is doing in the field of prevention, finally getting a separate appropriation and setting up a distinct department for the prevention of blindness. We have with us this morning the director of that prevention department who will tell us something about what New York State is doing in the field of prevention. Miss Sarah A. Clendinning.

The Preventive Work of the New York State Commission for the Blind

MISS SARAH A. CLENDINNING, R.N.
Director of the Department for Prevention of Blindness, New York State Commission for the Blind, New York, N. Y.

By legislative enactment the New York State Commission for the Blind has been given a very definite responsibility in the field of prevention of blindness. The Law creating the New York State Commission for the Blind, Chapter 415, Laws 1913, Section 7, stipulates that it shall be the duty of this commission to continue to make inquiries concerning the cause of blindness, to learn what proportion of these cases are preventable, and to inaugurate and co-operate in any such preventive measures for the State of New York as may seem wise. The Commission may arrange for the examination of the eyes of individual blind or partially blind persons and may obtain and pay for medical and surgical treatment of such persons whenever in the judgment of the commission the eyes of such persons may be benefited thereby.

Organized work for the blind in New York State, including preventive case work and some publicity activities, was started some 15 years ago and during that time several meetings were held to stimulate interest in a prevention of blindness program but it was not until 1926 that a conference was arranged with representatives from the various State Departments—Education, Health, Labor, and from the National Society for the Prevention of Blindness. The object of this conference was to present a picture of the combined activities then being carried on, their responsibilities and their needs, and to ascertain whether or not the program of the Commission would infringe on or duplicate the work of other established departments. After a full consideration of the facts it was agreed that there was a very definite need to carry on such a program for prevention of blindness and to put this program into effect with these joint departments. This relationship would bring about cooperation with other agencies not having a direct responsibility for prevention of blindness. It would result in other departments passing on their problems to the Commission. An appropriation to carry out this program was then sought from the legislature. This request was endorsed by the various State departments, local associations for the blind, welfare agencies, American Foundation for the Blind and by the National Society for the Prevention of Blindness (expatiate). The appropriation was granted in 1927 and made available for use July 1, 1928. We feel it was a splendid endorsement of the New York Society for the Prevention of Blindness which really won for New York State its appropriation. It was granted and this money made available for use July 1, 1928. And so it was but a year ago that the Commission was enabled to form a Department within its own organization to concentrate on statewide prevention of blindness and conservation of vision. This Department was inaugurated on July 1, 1928, with a director and two assistants, who are graduate nurses with experience in public health activities and in eye work. The work of the Department may be briefly outlined under three general headings. I might say here that this is our program although, of course, we have not been organized long enough to carry it out in its entirety. It represents our hopes as well as our present work. Under the first heading, General Educational Work, we include: research; distribution of literature on prevention of blindness; newspaper articles including human-interest stories; radio talks; circulation of reprints; and lectures and illustrated talks.

The second classification deals with co-operation with our state departments and local organizations. Under this heading we have a state health department program which includes: Social hygiene, particularly ophthalmia neonatorum; pre-natal care in preventing congenital syphilis; and assistance in pre-school programs by demonstrating eye testing.

We assist our State Department of Education by stimulating local interest in: sight conservation classes, through finding the children, arrange for eye examinations and any needed follow-up until they are admitted to conservation classes or provided with clear-type books.

We also assist local hospitals by stimulating social-service departments in the follow-up of serious eye cases. In addition we endeavor to give assistance and advice to local health and welfare agencies in procuring expert eye care, and to stimulate the interest of county medical societies in the establishment of local eye clinics.

The department also maintains a co-operative plan with the State Department of Health whereby all ophthalmia neonatorum cases, after going through the regular reference channels to the State

Health Department, are referred to us for a check-up and final report to know whether or not there has been any destruction of vision. This follow-up plan gives the department another opportunity, not only to stress the value of prenatal care, but also to be notified of all cases of ophthalmia neonatorum where local resources seemingly fail to meet the need.

The Department of Health program in New York State includes pre-school clinics. We assist these clinics by a demonstration of testing the eyes of these children.

The State Department of Education has sought our assistance in arranging for expert eye care for children living in rural sections of the State. So far our greatest contribution in this connection has been in finding children, arranging for eye examinations and any needed follow-up work until they are admitted to Sight Conservation classes or provided with clear-type books. We also endeavor to stimulate the interest of the local school authorities in the need for these classes.

Our third classification includes the assistance given to professional groups and volunteer agencies. To carry on this work we maintain an Information and Service Bureau for public health officials, doctors, nurses, social workers, and individuals. Talks at County and State conferences on prevention of blindness and conservation of vision are given. We have exhibits at State fairs, health and welfare conferences, clubs, Commission sales, etc. In addition, we are assisting the nine local associations for the blind of the State outside of the metropolitan district, by planning for them an educational program stressing the importance of including preventive work in their activities.

It might be of interest to know how the program was begun. A medical and advisory committee was formed consisting of a representative, as Chairman, from the National Society for the Prevention of Blindness, the Commissioner of the State Department of Health, the Director of the Division of Social Hygiene, Department of Health and the eye physician on the staff of the State Department of Education together with four prominent ophthalmologists in New York State.

Press notices telling of the Department for Prevention of Blindness were released and these notices appeared in practically every newspaper in New York State. Many interesting editorials as well as many inquiries from individuals and organizations resulted from this publicity. Simultaneously a form letter was prepared, outlining the department's activities and sent to the various State departments, county welfare organizations, doctors, nurses, social workers, and clubs. In addition a special form letter was sent to every eye physician in New York State, exclusive of the metropolitan district.

This newspaper and form-letter publicity brought so many inquiries regarding eye problems, that a nurse was assigned to this phase of the department's activities, who spends most of her time taking care of the medical and social work involved, arranging and making it possible for all cases to have an eye examination by an eye physician. This is done wherever possible in co-operation with local workers because they are nearer the field of action and because it is a local responsibility. The major part of this activity is carried on by correspondence. During the past year, exclusive of the State's Home Teachers medical problems, several hundred cases were referred to us for special attention. In addition, a follow-up correspondence is maintained regarding eye accidents referred to the department through a news-clipping bureau service, and over 50 per cent of them have been heard from and classified.

The department is actively co-operating with the State Department of Health in its prenatal program by assisting in Health Week activities in various parts of the State and by spreading educational information concerning the care and treatment of expectant mothers to prevent syphilitic eye infections of infants.

The Chairman suggests certain questions which should be answered at some time as definitely as possible.

In answer to the Chairman's question, "Is the work for prevention of blindness an activity entirely distinct from the welfare work for the blind?" we may say that it has been our policy to keep these phases of the work separate in so far as that is at all possible.

"To what extent is there duplication of work in any State?" We feel that there is practically no duplication in our work in New York State. The only chance of having this occur is in connection with newspaper publicity work. It has been the Commission's policy unless we have something of specific interest to New York State, to leave the newspaper publicity in the hands of more competent people, namely, the National Society for the Prevention of Blindness.

"What efforts are being made to correlate in the state the various activities for the conservation of vision?"

"Does the combination of work for the blind and prevention of blindness arouse confusion as to the latter?" It does, but we hope our educational campaign will clarify this situation.

"What State legislation for prevention of blindness should be advocated?" Legislative measures making it mandatory for physicians as well as midwives to use silver nitrate in the baby's eyes at the time of birth.

I think our department is distinct, doing definitely prevention work and, as the Chairman says, a certain amount of work in the prevention of blindness has to be done which is carried on by this department. The rest of the departments are quite distinct from the Commission as a whole.

CHAIRMAN CARRIS: We are sorry we can't hear from more of the official agencies primarily connected with the work for the blind because we would have the same interesting story from many states.

We must pass to the second classification, and here the program confines itself to Missouri activities, the State Board of Health, the Missouri Department of Labor and Industrial Inspection and the Missouri Bureau of Mines.

First, we shall hear from Dr. Stewart, State Health Commissioner. We are very glad, indeed, to have a State Health Commissioner with us this morning.

The Work of the Missouri Board of Health

James Stewart, M.D.
State Health Commissioner, Jefferson City, Mo.

The available resources of a state are made up of the sum of its natural resources multiplied by its physical or vital resources. The natural resources are fixed for the most part, while the vital resources are variable. They may be increased by improving the condition of the public health or decreased by disease prevalence. If disease be held to the minimum and public health developed to the maximum, the county or state is free to develop its natural resources to greater productiveness and wealth.

There is no more fundamental responsibility of government than the protection of the public health. The general activities of the State Health Department have gradually expanded as scientific knowledge of the methods for the prevention and the control of disease, and the factors essential to the improvement of health have advanced. For several years the Department of Health has been giving consideration to the prevention of blindness, particularly as it applies to the eradication of trachoma, the suppression of ophthalmia neonatorum, and the education of the public on the preventability of disease. Specifically, the State Board of Health of Missouri has attempted the following:

(1) To improve the lighting systems of the public schools in rural Missouri to eliminate eyestrain. This work has been carried on in connection with the State Department of Education.

(2) Eye testing by the personnel engaged in school examinations. This work, for the most part, has been done by the health officers and nurses to determine defects of vision and, where found, specifically to refer the child to his family physician, and he in turn to the specialist if desired. The State Board of Health and its agencies are averaging 85,000 school examinations annually. Of course, this figure does not include the larger towns, since they are blessed with their own well-organized departments of health.

(3) Educational work, embracing courses of instruction to expectant mothers, urging complete physical examination, including Wassermann examination, and also stressing the importance of the

use of silver nitrate in the eyes of the newborn baby. The Department has had furnished to it from physicians throughout the state the names of approximately 3,300 rural mothers annually, who have in turn received the nine prenatal letters of instruction. Much more could be said on the public health educational work sponsored by the State Health Department.

(4) Free distribution of silver nitrate ampules to doctors and midwives. Since 1921 Missouri has had a law (Sec. 7340 to 7342) requiring the use of medication in the eyes of the newborn to prevent infant blindness. The Department designated the use of a one per cent solution of silver nitrate for this purpose, in keeping with the regulations of other states. The problem for the prevention of blindness in babies resolved itself into: first, education regarding the need of preventive measures; second, to urge the use of a one per cent silver nitrate solution by physicians and midwives; third, the preparation and distribution of silver nitrate ampules; fourth, enforcement measures. Before the Department prepared and distributed the wax ampules, the physicians and midwives had trouble carrying fresh silver nitrate solution, since the material deteriorated rapidly in bottles. Physicians, therefore, would not comply with the law but used any solution they personally desired. When the silver nitrate solution is placed in individual wax ampules it remains satisfactory for several months and offers a convenient and safe method of carry ing and applying the material. Since July, 1926, the State Board of Health has been furnishing the ampules free of charge to physicians and midwives. A total of 24,867 ampules was distributed last year. It is pleasing to note that the birth records filed in the Bureau of Vital Statistics show that the profession is using the silver nitrate, and it is further pleasing to note that we are now and have been for several years receiving very few reports regarding ophthalmia neonatorum. I have been informed that there has been but one new admittance in the last several years to the Blind School as a result of this disease.

(5) Trachoma eradication. The State Board of Health and the U. S. Public Health Service have for several years carried on extensive work in the control of trachoma. In addition to the hospital at Rolla, which is financed jointly by the Federal government and the State Board of Health, forty co-operative field clinics, county-wide in nature, have been held to diagnose and treat the clinic type cases. Altogether 4,513 examinations have been made on suspected cases, with a positive diagnosis of 1,216. Of these, 250 were treated at the clinics, and the remainder were either sent to a specialist or recom-

mended to the hospital at Rolla. The U. S. Public Health Service has also maintained a research laboratory in connection with the Trachoma Hospital at Rolla, at which very important scientific problems in regard to the cause, transmission and prevention of trachoma have been studied and investigated. There have been 1,356 admissions to the hospital, and in addition 161 dispensary type cases treated.

Eighty-seven counties have been represented at the hospital, and nine states have sent patients to Rolla for treatment. Of the patients admitted to the hospital 853 were admitted one time; 136 were admitted two times; 36 were admitted three times; 14 were admitted four times; 11 were admitted to the hospital five or more times. The economic importance of trachoma is most certainly worthy of consideration in Missouri. In 1922 there were 1,115 trachoma blind of the total 6,000 blind pensioners, while in 1928 the records reveal 709 trachoma blind. There is an interesting fact in considering the figures of the trachoma blind. Though they show a consistent reduction from 1922 to 1927, we note that in 1927 there were 637 trachoma blind of the total 3,153 pensioners, while in 1928 there were 709 of the total 3,262 pensioners, an increase of seventy-two trachoma pensioners. Whether this increase was due to the fact that some had for the first time, as in Texas and Reynolds Counties, heard of a blind pension in Missouri, or whether it was partially due to a difference in opinion of examiners as to the eligibility for pension of the applicants is a question worthy of consideration.

In considering the economic importance of trachoma, we must think of this disease as mainly attacking the lower social classes. Therefore, the number of trachoma pensioners has a greater economic significance than the blind from glaucoma or cataracts. I feel that we may assume, in analyzing the trachoma figures, that the great majority of adults who are totally blind from this disease really appear on the pension rolls because they are of the class which would not be disqualified under the other clauses of the blind pension law. This I feel would not be true of glaucoma as, in all probability, there are many in our state blind from this disease who have financial means enabling them to care for themselves. Therefore, they do not apply for the pension.

In addition to the special work which the State Board of Health has been attempting in the prevention of blindness program as it relates to trachoma, ophthalmia neonatorum, and luetic infections, the Department feels that the work which it is carrying on in furthering public health generally to awaken a health consciousness will render returns in the prevention of blindness work as well as in the other phases of public health.

CHAIRMAN CARRIS: That is a very interesting report. I am going to ask Dr. Royer if he won't apply to the state and prevention health authorities to have Dr. Stewart repeat this paper at the next meeting of that organization so that every state health commissioner in the United States may know what Missouri is actually doing on the firing line in the prevention of blindness.

The second Missouri department to report here this morning is the Missouri Department of Labor and Industrial Inspection, Jefferson City, Missouri. Mrs. Amanda D. Hargis, Commissioner, will tell us of the activities of her department.

The Work of the Missouri Department of Labor and Industrial Inspection

Mrs. Amanda D. Hargis

Commissioner, Missouri Department of Labor and Industrial Inspection, Jefferson City, Mo.

There is always danger in specialization. So long as the centipede kept his hundred legs there was little risk of his ever needing crutches or suffering from flat feet. But when he discarded all but four and became a quadruped, though he quintupled his speed, he multiplied his risk of disaster twenty fold. Similarly when in a remote period the modest angleworm got tired of being all eye, and decided to concentrate his power of sight into two little pigment spots just above the behind his mouth, he gave fortune a chance to blind him at one stroke.

Mother Nature has done a marvelously good job for us in protecting our eyes, for though they are soft and elastic, as they must be to adjust themselves to both far and wide vision, the bony structure around them protects them. And our respect for Mother Nature rises further when we look into the cause of the loss of this her most precious gift, sight. If we were to be asked what was the deadliest and most frequent cause of loss of sight, most of us would, unhesitantly, blame accidents and injuries, blows, missiles, explosions, sparks, flying particles and chemicals. But as a matter of fact, all accidents put together only account for barely four per cent of our 52,000 recorded cases of blindness in the United States, according to the 1920 census report.

A swarm of perils to our eyesight lurk in machinery, in metal lathe work, in explosions, in the heat of blast furnaces and the spark showers of rolling mills. Some of our great steel mills found that the number of cases of serious inflammation and lasting damage to the eye among their workers fell 80 per cent within a few months after the establishment of a dressing room in the plant and a physician in constant attendance during the working hours.

It is estimated that approximately 15,000, or 13.5 per cent, of the total blind population in the country lost their eyesight through industrial accidents and that 10.6 per cent of all permanently disabling accidents involve the eye. In addition to the incalculable loss to the individual, the cost of maintaining these blind persons and the actual economic loss cannot be estimated.

Great reductions in this class of accidents have been effected in many industrial plants through the provision of goggles or safety devices on machines for workers who are subjected to hazards from dust and flying objects, and several companies report almost complete elimination of serious injuries to the eye. Several states and the United States Bureau of Standards have devised safety codes in which the particular kind of goggle or protector required in different occupations is specified. These codes give explicit information as to the best design and methods of testing any protector. The nine dangerous operations specified in the national code are processes in which there are flying objects such as chipping, calking, and riveting. Processes such as use of abrasion wheels, where protection is necessary from dust and small flying particles; operations presenting dust and wind hazards, such as automobile driving, locomotive driving and firing; processes such as casting where there is danger from splashing metal; protection from gases, fumes, liquids, as in the handling of acids and caustics, galvanizing tanks and japanning; protection from dust and small particles in sand-blasting; operations where protection is required from reflected light or glare.

Insurance shows that abrasive wheels produce 31 per cent of the total injuries of all sorts requiring medical aid for the eyes. This does not mean that the abrasive wheel is the most dangerous machine in industry; it is merely a reflection of the fact that there are perhaps more abrasive wheels in operation in the United States than any other machine of high eye accident frequency. Every factory is equipped with one or more abrasive wheels. The so-called emery wheels and grindstones are the type most commonly used.

The eye hazards incident to emery grinding are threefold: first, emery dust from the wheel itself; second, fine particles from the metallic surface which is being ground; third, flying parts of an abrasive wheel which has been broken while revolving at great speed. Goggles do not provide sufficient protection against hazards of exploding wheels. Safety lies largely in preventing explosion.

Fortunately the greatest hazards in connection with the use of abrasives are those of flying particles, which can be entirely eliminated by the use of proper goggles. Goggles for grinders need not be of the heavier type. The thickness of the lens should be based on the kind of grinding in which the workman is engaged. If the operator has to grind all day, every effort is made to avoid the discomfort of goggle wearing. Hence he is permitted to wear light weight thin lens goggles, and this increases the hazard where chipping is done as a chip would break the thin lens and injure the eye. It is necessary for our inspectors to observe that the operators who grind do not exchange their thin lens goggles to the chippers which require the heavy lens. It is necessary to have the colored lens against splashing acid.

As soon as the glass has become seriously pitted from the flying emery particles, new lenses should be inserted so that the worker's vision may not be interfered with. The flying emery particles are white hot, and when they strike the eyeball they are very likely to burn their way into the tissues. This often causes a very serious infection. When the operators observe the particles pitted on the goggles and fully realize that these particles would have entered the eye if not protected it would naturally be concluded that the operator would not attempt to use an emery wheel without goggles, yet they do it frequently. Some industries have taken the trouble to post a pair of pitted goggles on the safety bulletin board or some conspicuous place where every one who has occasion to use goggles can have a concrete example of what the injury to the eye would have been if not protected by the goggles. This has proven very effective. The inspectors of Labor and Industrial Department are cautioned to call attention to having one pair of goggles on a nail by the wheel for the use of all men who may use the wheel. Such a practice aids in communicating diseases of the eyes. We insist that a substantial pair of goggles be supplied to each workman who has occasion to use the emery wheel even if only once per week. God speed the day when the community goggles will be exiled by legislation.

There is another practice of preventing eye injuries by engineering revision; these glass shields, metal hoods and ventilators have in many plants almost completely eliminated the danger of eye injuries in grinding operations. The plants of the Ford Motor Company and other companies and the United States Corporation provide concrete examples of the possibilities in this direction. Our Department insists on goggles being worn where they have an exhaust system because the goggles protect against a momentary failure of exhaust system which is designed to carry off both the dust particles of the emery wheel and the metal being ground.

To return to our own phase of the goggle question, after adopting a goggle which is considered suitable for the general run of the work, we purchased them in gross lots. We see to it that each man is furnished with a pair of goggles where a pair of goggles is indicated. This has been a big factor in the shops' getting men to wear goggles. There is a curious complex in relation to the worker and goggles; he will drink from the same receptacle as his fellow worker, or smoke another's pipe, but he seems to have a natural repugnance to wearing another's goggles.

Some employers may think that the expense of furnishing each worker with goggles where goggles are indicated is enormous. But the expense is not great when you consider that the annual loss to industry through eye accidents exceeds $23,000,000; or when you consider that approximately 15,000 owe their blindness to industrial causes, and that there are more than 200,000 industrial eye accidents occurring each year; or when you consider that the excessive prevalence of eye conditions among workers in stone and abrasive industries is costing more for compensation and indemnities than for all other injuries in this industry. One large company has furnished some of its workers with goggles that have cost as much as $28.00 a pair and considered it, without any question, a good investment.

One state penalizes the worker by deducting 15 per cent of his compensation if he does not use the safety devices which the employer provides. Another state penalized the employer by adding 50 per cent to the compensation if he does not properly safeguard his works. This state also has a merit rating system in which the employer benefits considerably when his accident rate is low.

Although the development of the safety movement in the past decade has done much to improve conditions, all that has been accomplished thus far is said to be only a beginning. There are still numberless plants, where there are serious eye hazards present, in which no goggles are available even where workmen on their own initiative might apply for them. In many other plants workmen wear goggles on their caps or in their pockets unless the "Boss" is watching them; and there are still many plants in which there are shop mechanics who are experts in removing particles from the eyes of a fellow workman with such objects as toothpicks, matches, nail files, handkerchiefs, or even the tongue. There are two reasons which account for such conditions in a period in which a generally high degree of industrial efficiency has been reached: first, as a rule it is only in the larger plants which are able to afford a safety engineer and which keep accurate records of the accident experience, where it is realized that eye accidents are the most serious and costly of the non-fatal accidents; and, second, the failure to stress sufficiently the possibility of injury to the eye results from the fact that the eye accident hazard is only one of the many serious hazards with which safety organizations, trade associations, and industrial commissions must deal, special attention being given to this class of accidents usually only in plants where there has been high frequency of costly eye accidents.

The solution of the problem of reducing or eliminating eye accidents is held to be in legislation, education and organized accident prevention activities in industry. A first essential for a satisfactory reduction in this class of accidents is the enactment of laws requiring the reporting of accidents and the provisions of safeguards. In spite of the sincere attempts of many employers to promote safety activities, the enactment of workmen's compensation laws has provided the greatest stimulus for industrial safety activities. Owing to the pressure of competition and the nearly universal temptation among both employer and employees to take a chance, it can be assumed that in those states in which there is no law requiring the safeguarding of workers from accidents and health hazards, where there is no law requiring employers to compensate workmen for injuries received in the course of their occupation, or where there is no law requiring even the reporting of accidents, little effort will be made to prevent accidents. For that reason intelligent legislation is a prerequisite of the prevention of eye as well as other types of accidents.

Legislation even of the most satisfactory kind must be supplemented by education of workmen, foremen, superintendents, plant managers, and owners, since many accidents can not be guarded against by any mechanical means. An analysis of more than a quarter of a million accidents in the plants of the United States Steel Corporation showed that hand labor was responsible for 44.04 per cent of these accidents. The use of mechanical safety devices or appliances could not possibly have prevented the majority of these accidents which were due to carelessness and the failure of workmen to follow simple safety precautions. The only remedy for this condition is thorough education of the individual workman in safe practices.

In addition to adequate safety legislation and safety education there is still the need for well organized accident prevention activities within the individual plant, mine, railroad, or other work place. Such activities include the provision of mechanical guards and safety devices, frequent inspection of plant conditions and operating methods, and the use of illustrated posters, warning signs, and other forms of safety literature.

The dollar cost of industrial eye hazards depends upon the following: the actual cost of compensation; the indirect cost resulting from the spoilage of raw materials and finished products, the latter often including extensive labor costs; and the slowing up not only of the work of the individual but of the whole industrial machine as a result of defective vision, poor lighting, eye accidents, and other accidents caused wholly or partially by poor vision.

In an effort to form some idea of the actual situation in the average plant where little serious attention is given to accident prevention, the committee sent a questionnaire to a large number of representative plants in which good safety work is being done. The plants were asked to report for the year 1922 on the average number of employees, the average number of goggles in use, the number of goggles damaged while in use, and the number of eye injuries. In 72 plants employing approximately 168,000 men, the eyes of 15,989 workers, or almost 10 per cent of the total number of workers, were injured during the year. It was shown that the use of goggles saved 1,522 workers from certain serious if not permanent eye injuries, as there were that number of goggles damaged by splashing molten metal, flying fragments of metal or chemicals. Many others were doubtless saved, as the goggles of each workman using them stop many flying objects which do not damage the goggles but which would seriously injure the delicate structure of the eye. The total number of pairs of goggles in use in these plants was only 18,205, an entirely inadequate number among 168,000 employees. Only 26 of these plants reported that the eyes of all new employees are examined, while 43 reported that no examination of the eyes of workmen is made. From the replies received it was evident that eye hazards are most serious in metal working plants. Since, in a group of 20 metal working plants, with a total of 30,980 employees, there were 6,769 eye injuries reported,—an average of one eye accident for every five employees.

Eye accidents happen everywhere in industry. A tabulation of injuries in which compensation was incurred showed all industries except clothing manufacturing and laundries. I will name some of the industries where injury to the eyes is frequent: coal mines, metal and metal products, public service, building and contracting, clay, glass and stone products, chemicals and allied products, lumber and its manufacture, food and kindred products, beverages, paper and printing industries, textiles, leather and rubber goods, jobbers and warehouses and woodworking.

We find that many injuries to the eyes are caused from flying bodies, by tools or moving parts of machinery, splashing liquids (molten acids or metals), explosions, falls and infections, electricity and steam pressure apparatus.

Our inspectors often find tools needing dressing and grinding are very dangerous to work with. A certain large corporation had several employees who lost their eyes through flying portions of tools and the management admitted that the condition of tools generally was bad. A competent safety engineer submitted a report as to a method of controlling the hazard. The engineer's report, after some changes were made, was put into effect. There was absolute control of every tool at the beginning and the end of every shift. Immediate dressing was given every mushroomed head. Edged tools had real edges, handles were straightened, every tool was made safe and efficient. If this plan is followed carefully there will be a great decrease in eye hazards. There are, undoubtedly, great opportunities for the prevention of eye accidents through engineering revision and through guarding, at the source, of flying particles. Until greater progress has been made in the application of engineering revision to the prevention of eye accidents, goggles and head masks remain unequalled as a means of preventing injuries to the eyes.

LIST OF EYE ACCIDENTS IN MISSOURI INDUSTRIES IN 1928

This includes industries having nine and more injuries

Coal mining	9
Underground mining	13
Lead and zinc mining	40
Smeltering	9
Quarries, crushed stone	20
Packing house	15
Clothing manufacturing	10
Boot and shoe manufacturing	17
Wood turned products	12
Rolling mills, iron, steel	12
Iron foundries	29
Boiler making	13
Machine shops, foundries	36
Electric apparatus	17
Automobile manufacturing	19
Auto bodies	10
Refractory products	10
Masonry	15
Plumbing	13
Concrete construction, bridges, etc	40
Plastering	11
Sheet metal work	19
Railroad operations, steam, all others	10
Railroad operations, street and elevated, electric	10
Gas works, all operations	15
Railroad operations, street, all others	27
Electric Light & Power Co	26
Lumber yards and building material dealers	9
Auto sales and service, all others	37

929 eye cases in 1928 cost Missouri $214,459.00.

The inspectors from the Department of Labor and Industrial Inspection see to it very carefully that proper protection is provided when working in industries where splashing metal exists. The nature of the operation largely determines what style of protector—whether goggles, face masks, helmet, shield or hood—is used. Where there exists any danger of explosion we require a regular face mask for the protection of the entire face.

The inspectors also see that the light in factories and plants is sufficient. It is obvious that no person can do his work efficiently unless he can see what he is doing, clearly and comfortably; yet this fundamental principle of industrial hygiene and business efficiency is violated in thousands of factories and offices. As a result the worker suffers from eyestrain. The proper lighting of factories and other places has always been important from the standpoint of conservation of vision and prevention of blindness. The vision of the best eye in the world becomes defective where there is glare or insufficient illumination. Approximately 24 per cent of our blind is due to the poor lighting; in factories where garments are made special attention is given to the light being properly located and sufficient. The inspector makes a survey of the natural and artificial lighting of any place of work and takes into account the following factors: arrangement of windows and skylights for maximum natural light; arrangement of desks, machines and work benches so that employees do not face the windows; avoidance of shadows, especially at the operating points of the machine. Any lighting method, natural or artificial, must take into account three factors: sufficiency, continuity and diffusion. Windows must be kept clean. To secure a proper diffusion of light, attention must be given to the interior decorations of the working place. These should be, in general, light in color as practicable for ceilings and upper portions of walls, and have a dull finish; the walls should be cleaned or renewed at intervals.

The industries of the country are now paying approximately $10,000,000 a year as compensation to workmen who have been totally or partially blinded while at work. This is a direct loss. There is a further direct loss to the working men and women of America through lowered efficiency or earning capacity following blindness or serious impairment of vision.

The greatest possibility for the elimination of the unnecessary eye hazard of industrial occupations lies in education: education of the state as to its moral and economic obligations; education of the employer as to the desirability of supplying adequate protection for the eyes of his employees; and education of the employees as to the necessity of using that protection when it is provided. We cannot expect certain types of employers to give serious attention to the prevention of accidents, to the provision of proper lighting facilities, or to protection of the eyes, if the state inspectors do not call their attention to these requirements. We quite realize that the prevention of accidents is both a moral and economic obligation of the state. Many employers of labor still need to be convinced that it is cheaper to prevent eye accidents than to pay for them; that it is cheap economy to use cheap goggles or to have a group of workmen share one pair of goggles; that the wearing of goggles or other head protection in dangerous operations should be made an absolute condition of employment. A report growing out of the survey of waste in industry, showed an estimated loss of 158,000,000 work days as a result of non-fatal accidents occurring in industry in one year. A conservative estimate of $1.50 per day paid to workmen for time lost due to accidents would show a loss of $237,000,000 to employers. It is estimated that eye accidents constitute 10 per cent of all non-fatal industrial accidents; on the basis of these estimates it appears that the loss to industry through eye accidents is in excess of $23,000,000 yearly. No employer or industrial manager who is aware of these facts will question the assertion that it is cheaper to prevent eye accidents than to pay for them.

I will suggest to the plants to check up the various jobs to find where goggles are necessary; then thoroughly examine the goggles worn by each employee to determine whether they fit him perfectly and whether they give adequate protection. I think a very good plan is to have departmental safety meetings. I have attended some of these meetings and made an address on safety education. At these meetings there should be a frank discussion of the plants' eye accident records the eye hazards to which the employees are exposed; goggles broken in service should be exhibited; goggles splashed with molten metal should be shown; and statements by workmen wearing these goggles when they were damaged should be given.

Following a distinctive eye injury, the workman is often confronted with the problem of learning a new trade. This is very difficult under an awful handicap. Frequently the loss comes after middle age and it is difficult for the injured person to learn a new trade then. Sometimes he can remain in the same trade with lowered efficiency and consequently lowered earning capacity. And there are a few jobs for blind men or near blind men by which a family can be supported.

In conclusion I wish to say we have found our campaign against serious eye accidents distinctly worthwhile. From what has been said in the foregoing, it must not be gathered that our experience is at all unique. An elaborate survey made recently found that where goggles were furnished to workers, eye accidents were reduced 90 per cent. The American Car Foundry Company reduced their eye accidents 80 per cent where goggles were in use in the plant. Undoubtedly hundreds of other plants can show as good a record.

CHAIRMAN CARRIS: I feel like congratulating myself on the program and the audience because I think this is the first time I have known of in the history of such gatherings that we have had representatives of official agencies tell what is being done in this way. The third department is that of the Missouri Bureau of Mines of Joplin. Mr. Frank G. Fenix, Chief State Mine Inspector, will tell us about the work for the conservation of vision in that department.

The Work of the Missouri Bureau of Mines

Frank G. Fenix

Chief State Mine Inspector, The Missouri Bureau of Mines, Joplin, Mo.

"What is the State Bureau of Mines doing toward prevention of blindness?" This subject does not require a great many words. The Missouri Bureau of Mines, of which I have the honor of being the head, is a safety department, and it is our duty to see to it that State Mining Laws with reference to safety and prevention of accidents, fatal and otherwise, are strictly enforced. Our laws are intended to guard against all dangers to the lives, health and body of those working in the mines. While eyes are not especially mentioned, they are an important part of the body and are therefore included in our safety program.

On the part of the Bureau, no special efforts have been made tending to prevent blindness, although the careful study of ventilation in the mines, the introduction of better lighting systems underground, and the elimination of dust and smoke in the mines while men are at work, naturally add to the protection of the eyes against blindness.

Aside from the exercise of ordinary care and the Bureau's general program of Safety First, we know of no special effort being put forward in the coal mines to prevent blindness, nor is the danger of eye accidents as great in the coal mines, because coal is of softer substance, does not chip as readily as the rock formation of the metal mines, and because the augurs and drills used in mining coal are of a different type machine than those used in metal mines.

In our large lead and zinc mines prevention work against eye accidents and blindness is carried on. The large mining companies furnish goggles to employees for use on all hazardous jobs, such as drilling, grinding, chipping, sledging, handling hot metals and chemicals. The small number of serious eye injuries during the last few years in a measure indicates that the men are using the eye protection provided. Approximately 5,000 men are employed in the metal mines of the state.

Recently a trachoma clinic was held in the southeastern lead district, sponsored by the U. S. Public Health Service and assisted by the local health officers and safety engineers, for the purpose of examining eyes of miners, suggesting proper treatment and prescribing measures of prevention of trachoma or granulated eyelids. In this field, at the present time, an eyesight survey is being conducted by the mining companies of all their employees for the purpose of ascertaining the condition of the individual's eyes and to suggest corrective measures, if defects are found.

The Bureau of Mines is in complete harmony and co-operation with our safety engineers, mine operators and miners, and we are hopeful that prevention of blindness will receive a greater share of attention than it has in the past, although we are not aware of any cases of blindness that have occurred to employees in the mines of Missouri in recent years, because of unsatisfactory working conditions. This Department will always be ready and willing to co-operate with any agency looking toward better conditions for the workers in our industries, and for the prevention of blindness in particular, to which your Society has given so much thought and effort.

I should like to show you the type of goggles used in our metal mines. These were furnished to me by the safety engineer of the National Lead Company. These were worn by a man pouring a boxing on an underground locomotive. The babbitt exploded, likely caused by a drop of water or something cold coming in contact with the babbitt. The glasses are shot full of the metal, burned right into the glass, but the man's eyes were not injured. I understand he was burned on the face. I was informed by the safety engineer that the chances are the man would have lost the sight of both eyes had he not been wearing these glasses.

This (exhibiting a second pair of goggles) is the type of goggle worn by our men when sledging and drilling,—a screen goggle,—and while it looks dark, they can see through it very well. Our safety engineers and mine foremen see that the men wear these goggles. If a man is found sledging boulders or starting a drill hole without his goggles he is, for the first offense, reprimanded; for the second, he is required to report to the office.

CHAIRMAN CARRIS: We pass now to the volunteer agency directly concerned in prevention of blindness. I have been to Baltimore twice within the last month. I went to the dedication of the Wilmer Institute and the second occasion, more interesting to me, was the annual luncheon meeting of the Maryland Society for the Prevention of Blindness. I know at first hand the real work which is being done in that great state to prevent blindness. We have Mrs. Francis W. Little, the Executive Secretary, here this morning to tell us about the work of the Maryland Society.

The Work of the Maryland Society for the Prevention of Blindness

Mrs. Francis W. Little
Executive Secretary, Maryland Society for the Prevention of Blindness, Baltimore, Md.

History of Maryland Society.—The first movement to prevent blindness in Maryland was begun in 1892, when Dr. Hiram Woods read a paper before the Maryland Medical Society, the result of which a committee was formed to consider legislation relative to ophthalmia neonatorum. In 1892 the committee secured an enactment of the law. When this law became effective, eight midwives were prosecuted and convicted, and the general use of a prophylactic was begun in the obstetrical departments of hospitals. Today a case is rarely seen in these institutions.

The Mother's Relief Society of Baltimore made an investigation in 1908, and found that in the Maryland School for the Blind, 29 per cent of blindness was due to ophthalmia neonatorum, and 21 per cent was traceable to midwife practice. The next progressive movement to prevent blindness was the organization and incorporation of the Maryland Society for the Prevention of Blindness. The first meeting was held at the residence of the Secretary, Mrs. Joseph Colt Bloodgood, May 26, 1909, when Dr. William Henry Welch presided. The Honorable Charles J. Bonaparte was the first president of the Society. In 1910, through the influence of the Society, the Maryland Legislature enacted what is known as the "Midwife Law," which provided for the registration and licensing of midwives with certain educational qualifications. At the request of this Society, a bill was passed in the City Council, April 14, 1914, making ophthalmia neonatorum a reportable disease.

For a time the Society was quiescent, but in 1926 the Secretary of the National Society for the Prevention of Blindness began to discuss with Dr. Hiram Wood and others, the reorganization of the Society. Dr. Woods, then acting president, requested a survey to be made by the Medical Director of the National Society for the Prevention of Blindness. This survey showed the need of the work of the Society to co-operate with the different agencies to prevent blindness. The work was supported by interested private subscribers until January, 1929, when the Community Fund of Baltimore, having admitted the Society to membership, began its regular monthly allotments.

Since the reorganization of the Society, the Baltimore City Health Department has given more frequent inspection of midwife kits and free distribution of nitrate of silver in wax ampules to doctors and midwives, instead of allowing them to secure the solution at the drug store and using droppers, which had been the custom.

After conferences with the Health Commissioner and the Mayor, prompt and proper care of cases of ophthalmia neonatorum has been given and the expense met out of the Mayor's Departmental Fund. This is included in the Health Commissioner's budget, to be submitted to the Board of Estimates. In 1928 there was not one case of blindness from ophthalmia neonatorum.

Amending the midwife law and creating one for doctors in the use of a prophylactic at the birth of a child have been much agitated. The State and City approve of a law, but when the law which had been drawn up by a committee consisting of the most prominent ophthalmologists and obstetricians from this Society was presented to the Medical and Chirurgical Faculty of Maryland, before which body it passed, it was killed when it was taken to the Council of the Faculty. The Council feels that education is much better than compulsion, as far as the doctors are concerned, and that the rigid examinations of midwives is gradually eliminating them. In Baltimore last year only three out of nine passed the examination.

Dr. William Holland Wilmer, Ophthalmologist-in-Chief of the Wilmer Institute, Johns Hopkins Hospital, in a talk before the conference of the State Health Officers and Nurses, said: "There ought to be a law, and it ought to be very rigidly enforced." This talk has done much to crystallize the opinion of the "powers that be."

Prenatal Care of Expectant Mothers.—We are emphasizing in our lectures the importance of examinations of expectant mothers. This subject is also discussed very frequently in our Board Meetings and with the City and State Health Departments. At our May meeting, Dr. J. H. Mason Knox, Jr., Director of Child Hygiene, State Department, reported that the State is awakening to the necessity of having clinics. Western Maryland has two: the public health nurses are on the lookout and the Metropolitan Life Insurance Company is caring for its insured cases. The city is well covered. It has a clinic at Johns Hopkins Hospital, one at the University of Maryland, and the City Health Department has six.

Conserving the Sight of School Children.—A staff associate of the National Society for the Prevention of Blindness has demonstrated pre-school examinations of children's eyes before the Public Health and School Nurses, and in several public schools of Baltimore, as well as at the Friends School and the Maryland State Normal School. We are working for pre-school examinations, if possible, but certainly first grade. The Health Commissioner has included in his budget a provision for this service. The Lions Club of Baltimore has also financed the showing of trailers in 27 motion picture theaters, warning the public of Fourth of July accidents. This fall we have sent out to all private and parochial schools a letter and questionnaire, inquiring about the examinations of children's eyes, and the decorations and physical conditions of their school and study-rooms. The majority are replying and are very much interested. Letters have also been sent to the Parent-Teacher Association, and judging from the replies which are being received, our Society will have a very busy winter. I have two doctors from the Health Department who are on my Board giving lectures tomorrow, Tuesday evening.

Sight-Saving Classes.—Our Society has assisted very materially, co-operating with the City Health Department and the Board of Education, in the establishment of sight-saving classes in Baltimore. We have insisted upon trained teachers, have overcome the transportation problem, and furnished carfares and glasses when necessary. The past summer, the Lions Club of Baltimore paid the tuition and the expense of three teachers, for courses in sight-saving class work at Teachers College, Columbia University, and two more classes will be established in the near future, one a colored class.

Miscellaneous Questions Taken Up.—Questions taken up by the Society are: Trachoma and the possible menace to the State; the sale of fireworks; wood alcohol poisoning; artificial illumination in homes, schools and in industries; safety devices in the industries and the home; and warning persons of the dangers of eye troubles in mid-life.

Lectures.—Lectures, with and without slides, have been given to: Hospital Social Service Workers; Occupational Therapy Associations; Instructive Visiting Nurses' Association; Mother's Relief; Lions Club of Baltimore; Bible Vacation Schools; and Parent-Teacher Associations.

Co-operation.—Co-operation has been given by the: American Red Cross; Babies' Milk Fund Association; Baltimore Branch, National Council of Jewish Women; Jewish Children's Bureau; Baltimore Eye and Ear Hospital; Garrett Hospital; Baltimore Safety Council; Catholic Charities and Child Bureau; City and State Health Departments; Board of Education; Public School Association; City and State Children's Aid Societies; Baltimore County Children's Aid Society; Family Welfare; Fresh Air Society; Hospital Social Service Department; Illuminating Engineers' Club; Instructive Visiting Nurses' Association; Parent-Teacher Associations; Playground Athletic League; Prisoners' Aid Society; Maryland State Accident Commission; and Mothers' Relief.

Representatives from these different organizations formed the educational committee, the only committee which we had. I hope to use as many as possible for a Speakers' Bureau. The Wilmer Institute of Johns Hopkins University has proved a great blessing. All sight-saving class children are taken there, and the whole child is considered. The child is referred to different clinics when necessary, and these clinics work with the ophthalmologist in determining the source of infections.

The Maryland Society has concentrated upon ophthalmia neonatorum and conserving the sight of school children. It is work that is necessary everywhere and let me give you a little advice. Organize your private societies—the educators have their work, the shops have theirs—the prevention of blindness is a very special work and needs undivided attention. I believe it was Emerson who said: "Hitch your wagon to a star." My "Star" has been the National Society for the Prevention of Blindness, which has always been ready and willing to give advice and assistance along all lines. I have never made a request without getting the most complete co-operation. Education and co-operation are the watchwords of the Maryland Society.

CHAIRMAN CARRIS: Mrs. Little had such an interesting program at that luncheon I referred to, something I hadn't seen happen before. She had the Governor down for an address of welcome, and I thought of course when I saw the program it would be his secretary or someone who would come in his place, but suddenly the Governor came and on time. Instead of saying, "I am glad to see you; I am in a hurry and I must go," the Governor stayed right straight through and was really one of the last ones to leave the hall. I thought it was rather remarkable that the Society could interest a Governor to the extent that he would stay and take a real interest.

The Missouri Association for the Blind does work not only in Missouri but through the establishment of the Dana Medal has had some national attention and recently international attention. We are glad to have Mrs. Anna F. Harris, Executive Secretary of the Missouri Association, tell us about that Association.

The Work of the Missouri Association for the Blind

Mrs. Anna F. Harris
Secretary, Missouri Association for the Blind, St. Louis, Mo.

The name, "Missouri Association for the Blind," is a little bit misleading. The Association does local work, thus relieving the State of a big responsibility for a big city. The motive is not as altruistic as it appears on the surface. If Missouri did not take care of its rural eye patients, St. Louis would be flooded with the blind and nearly blind coming to the hospitals, clinics, etc., thus creating a social and economic problem which the City of St. Louis does not wish to be compelled to solve. Therefore the Missouri Association for the Blind's job is to prevent blindness and conserve sight. It is one of the biggest jobs in the world because it averts the biggest tragedy in the world, "Blindness." Blindness from any cause is deplorable, but to be pushed or shoved into the ranks of the blind through ignorance, carelessness or neglect is Society's crime and the victims are defenseless babies, school children, flaming youth and misspent old age.

In order to be equipped with authority to do its work, the Board of Health, the City Health Department and the St. Louis Medical Society, must be strongly entrenched behind the Society and with such weapons the Society marches forth fully conscious of its power and authority battling with ignorance which is no excuse for blind babies, 15,729 of whom were born in St. Louis last year. Missouri, or any other state where State Boards of Health and City Health Departments are willing to co-operate and furnish an antiseptic to be used in babies' eyes at birth and insist upon a birth record, is doing its job; but the campaign of education along those lines must continue and the National Society for the Prevention of Blindness must be the inspiration, educator and worker on the job at all times and all places. The Society's best field for this work will be to educate mothers, women in industry, midwives, nurses and, sometimes, even physicians. Notwithstanding all the efforts made, ophthalmia neonatorum has not yet been entirely overcome. Unfortunately the Missouri School for the Blind, in the past year had two ophthalmia neonatorum children, or children blind from birth into the school. St. Louis was not responsible for either one of them, one was born in Ohio, and the other in rural Missouri. We must demand fair play for the babies. Mothers' Clubs often find a talk on prevention of blindness or the care of babies' eyes less attractive than a finely illustrated talk on cooking utensils, baking powder, etc.

The eyes of pre-school children are mothers' responsibility if they are at home and not forced out by economic conditions; but the responsibility of the eyes of those children whose mothers are employed becomes a public responsibility, through the presence of these children at public day nurseries. In St. Louis the eyes of pre-school children have been tested through the co-operation of the National Society for the Prevention of Blindness whose representatives have presented pre-school eye testing demonstrations here. Thus, it is possible to test sight not only in the public schools through the school eye inspections, but in the pre-school age—which may prevent the development of a certain percentage of vision handicap in children later on.

Youth—with all its possibilities for good or evil, health or sickness —is the community's big responsibility. Groping hands and atrophied eyes, results of venereal diseases, tell again their story of ignorance, carelessness and neglect. It is the duty of any society for the prevention of blindness to stand side by side in co-operating with venereal disease clinics and social hygiene societies, in order to educate and warn youth of the dangers and results of untreated syphilis. Optic atrophy resulting from untreated, unsuspected venereal diseases has claimed more than its quota of blindness in St. Louis.

To sum up, the Missouri Association for the Blind attempts in its prevention program to carry on locally the principles of conservation of vision methods which are prescribed by the National Society for the Prevention of Blindness.

Discussion

CHAIRMAN CARRIS: All work for the prevention of blindness goes back to the medical profession.

Through some misunderstanding, an important gentleman has come to give the welcome at the luncheon who cannot stay, Mr. Holliday from the Commission. May I ask Mr. Holliday to speak for a moment?

MR. JOHN H. HOLLIDAY, Secretary-Treasurer, Missouri Commission for the Blind, St. Louis, Missouri: Eleven years ago today the World War ended in an armistice. We celebrate the anniversary of that day which ended the conflict between man and man. You are, however, engaged in a struggle which cannot end in an armistice but must continue until the enemy has been completely destroyed.

The Missouri Commission for the Blind, which, as you know, is a state-appointed body serving voluntarily, has worked with some success for the prevention of blindness, for the conservation of vision, for social service, and for the general welfare of the adult blind. You will note that we place the prevention of blindness first on our program because we believe in that field lies our greatest opportunity for effective work.

It gives me very great pleasure to extend to you a hearty welcome to the city of St. Louis. We wish to acknowledge in all gratitude the many courtesies which the National Society for the Prevention of Blindness has extended to us in the past and, on the other hand, we want to assure you that it is our desire to co-operate with you in every possible way in the future.

CHAIRMAN CARRIS: I started to say we co-operate, of course, with the medical profession on the firing line. The Chairman of the Local Committee on Arrangements is to be the next speaker, but not in that capacity. He is to discuss what has been said this morning as the representative of the Missouri Association for the Blind. We should like to have Dr. John F. Hardesty discuss for a few moments the papers or to say what he wishes.

DR. JOHN F. HARDESTY, Director, Conservation of Vision Department, Missouri Association for the Blind, St. Louis, Mo.: Mr. Chairman, Ladies and Gentlemen: It is very gratifying, indeed, to hear from all of these volunteer and official organizations, the wonderful things they are doing for the prevention of blindness as well as for the welfare of the blind. It is doubly gratifying to have for a guide and mentor the National Society, to help us along our way. I speak on behalf of the Missouri Association for the Blind and more particularly for the Conservation Department of which I have the honor to be the director. I feel that our particular work has to do more with sight conservation classes in St. Louis than with any other phase of the prevention work. Therefore, I feel I should devote most of the time I have to the sight conservation classes.

We have in St. Louis two white and one colored conservation of vision classes in the public schools. I think we have the distinction of having the first colored sight conservation class. We also have one sight conservation class in the parochial schools of the city which we consider a very great factor in getting started in the parochial schools, thanks to the help of Father Schwitalla.

All told, we have between 80 and 90 pupils in these sight conservation classes. We feel there are a good many more candidates for the sight conservation classes as soon as they can be established in neighborhoods where the children can get to them. The children with semi-sight cannot go long distances alone. We feel that is a great factor in keeping down our numbers until the schools are established in parts of town where they will do the most good.

In the conservation part, we also feel we should particularly enter into the treatment of the trachoma cases, have follow-up work on the trachoma cases to make sure that they are kept under care to prevent them, as much as possible, from becoming blind later on. Also we have very few cases of ophthalmia neonatorum, but we feel those we have should be under the care of the Missouri Association for the Blind, and they are. The Association also will, if called upon, furnish special nurses and special care and hospitalization for those babies with ophthalmia neonatorum, to save the sight of these children, which would otherwise be lost.

Further, in the field of interstitial keratitis, particularly, we try to see that children who are reported with interstitial keratitis are kept under care to save all of the sight possible. Although we know vision is going to be defective, we try to do the best we can.

There is one other thing we have done in St. Louis. The Missouri Association has undertaken to make some industrial surveys trying to combat industrial surveys carried on by mercenary organizations for the sale of glasses. These surveys have been carried on in industries to try to ascertain whether or not the workmen had sufficient vision to work in the positions they were occupying without endangering what vision they had. The Missouri Association took the responsibility of initiating this survey service in the larger industrial plants which wanted it.

We also undertake to a certain extent educational programs by giving, on request, lectures for the Parent-Teachers' Association on watching the eyesight of school children and urging that care be taken that no harm comes to their eyes.

I can't help but mention one thing here that I think has not been stressed quite enough. It has been very near to me for the last number of years. It is the Fourth of July fireworks celebrations. Even in my own practice I usually have from three to five cases every year of eye injuries from explosion of fireworks on the Fourth of July, or the third or the second of July. I feel very deeply that something should be done to limit the sale of fireworks in order to prevent this needless waste of eyesight. I believe I can safely say that in the past five years I have averaged two cases of lost eyes each year in my own practice just because of fireworks alone.

The Chairman has asked a question which I shall not attempt to answer officially regarding the welfare work for the blind and the prevention of blindness. Personally, I feel that welfare work for the established blind should be an entirely separate thing from the work for the prevention of blindness. It seems to me those who are already blind are an entirely different problem from those who may become blind through carelessness. I feel that the two should be entirely under separate heads. I also feel that the ideal condition in the prevention of blindness would be that all prevention work be taken over by the state, if that were possible. To illustrate that, I remark that I believe ophthalmia neonatorum has been in the past one of the greatest, if not the greatest, cause of blindness. Today it is one of the minor causes of blindness, due to legislative enactment enforcing the prophylactic treatment of eyes of newborn babies. That, to me, illustrates that the state and the state alone can pass legislative acts forcing the prevention of blindness. The unofficial agencies certainly cannot force anything. They can spread propaganda but they cannot enforce it. The official agencies, it seems to me, should handle the preventive measures to have an ideal condition.

CHAIRMAN CARRIS: I wish I had time to tell about the next speaker, too. The people of Missouri are going to know her better the next few months and learn to love her as we do who have watched her work in other parts of the country. It is a very great pleasure to introduce the new Executive Secretary for the Missouri Commission for the Blind, Mrs. Mary Dranga Campbell.

MRS. MARY DRANGA CAMPBELL, Executive Secretary, Missouri Commission for the Blind, St. Louis, Missouri: I feel that it would be rather presumptuous of me, who have been in the state only for the past five weeks, to talk to you about prevention of blindness in Missouri when the director of our prevention of blindness department has just told you of its activities. I shall, therefore, confine my remarks to answering the questions which Mr. Carris has asked in his paper as they pertain to the work of the Missouri Commission for the Blind and tell you what my reaction has been in the short time in which I have had an opportunity to study the situation.

The Pennsylvania State Council for the Blind, with which I was formerly connected, is, as Mr. Sinclair, its newly appointed Executive Director, has told you, a co-ordinating body with advisory and supervisory powers and I am happy to have had the privilege of assisting in the development of its program during the past four years.

I was attracted to Missouri, however, because I wished to have personal direction of the activities that have developed under the Missouri Commission for the Blind, such as prevention of blindness, home teaching, home work, industrial training, placement, employment, shops and sales, etc., and which in Pennsylvania have developed under private agencies.

The first question in Mr. Carris' paper is as follows: "Is the work for prevention of blindness an activity entirely distinct from welfare work for the blind?" Personally, and I have held this view for some time, I do not think it is necessary for the work for the prevention of blindness and the work for those who have already lost their sight, to be separated. I feel, however, that the department or the phase of the work that has in charge the prevention of blindness should have a program distinct from that of employment or social service work among the blind.

"If not, how can the common activities be defined?" This can be effected by the proper correlation between the different bureaus of the organization—the same type of case work and follow-up can be used for those who have lost their sight and for those individuals coming to the attention of the prevention of blindness department.

In Missouri the work of the different bureaus is of necessity very closely interwoven.

"To what extent is there duplication of work in any state?" It would be unfair for me to attempt to answer this question as it pertains to Missouri as I am not yet familiar enough with the work of the various public and private organizations concerned with the prevention of blindness. I came here this morning to listen, as I had not had an opportunity to read the papers that were to be presented before taking part in this discussion. I assure you I have learned a great deal more about the State of Missouri, as well as the work being carried on to prevent blindness, than when I came into the room. The elimination of duplication, if there is any, between the public and private agencies should be reduced to a minimum. This can be accomplished only by developing a closer method for the exchange of information than perhaps we have had in the past.

"What efforts are being made to correlate in the state the various activities for the conservation of vision?" When the Missouri Association for the Blind and the Missouri Commission for the Blind were separated, some four and a half years ago, the Missouri Association became responsible for work for the prevention of blindness and conservation of vision in the City of St. Louis, and the social service and relief work (other than the pension) among the adult blind of the City, while the Commission, in addition to its other activities, took over the workshop established by the Association in its early days. The work for the prevention of blindness and the conservation of vision in the rest of the state is therefore under the Commission. Very little has been done so far to develop a state-wide program for the prevention of blindness. Plans are already under way, however, for greater activity in this direction.

"Does the combination of work for the blind and prevention of blindness arouse confusion as to the latter?" I believe that in Missouri there has been considerable confusion in the minds of the public between the work of prevention of blindness and the work for the blind, due to the fact that the outdoor relief, or the so-called pension, was firmly established before a state-wide program for the prevention of blindness or industrial training and employment had been started. With the large number receiving outdoor relief in this state, the public has been thinking of the blind largely in terms of the pension only, and has not realized that the Commission was charged with the prevention of blindness and providing training and employment for the blind indiscriminately of whether they were on the pension roll or not. It will be necessary to carry on an educational campaign in all parts of the state to interpret the work of the Commission in its true proportions. Any state that pays a fixed amount in outdoor relief will be faced with many problems in the development of its placement and industrial work. One can readily understand the temerity on the part of the blind person in giving up a fixed allowance for the uncertainty of what he may receive in industry. I want very much to try an experiment with a group of men by testing their ability in an effort to raise their earnings to a point where we can guarantee them the weekly wage they are now earning plus the weekly allowance from the state. Our capable blind men and women should have this opportunity, and I believe that in making this possible we will go a long way toward educating the public.

The investigation of the applicants for the outdoor relief and the certification of the eligible ones to the State Auditor is a duty imposed upon the Commission by the Legislature. The department for the prevention of blindness has not had a chance to develop a broad program as it has been overloaded with the work for the applicants for the pension whose sight could be improved by operation or treatment. We are now working toward separating the work with the applicants for the pension from a strictly prevention of blindness program.

"Should there be local or regional volunteer societies for the prevention of blindness?" I have no doubt that in certain sections of our great country it is perhaps practical to have regional or local volunteer societies devoted entirely to the prevention of blindness, and I admire any organization that carries on such a constructive piece of work. In Missouri, however, I do not think it would be advisable to have another organization. We now have the Commission, with its state-wide program for the prevention of blindness, and each of the five local organizations also have prevention of blindness as a definite part of their program. I believe that if the Missouri Commission is a full functioning state-wide organization there will be no need for a separate organization for the prevention of blindness.

Naturally, I am not at present in a position to answer the question: "What state legislation for prevention of blindness should be advocated?" The basis for efficiency in work for the prevention of blindness in Missouri for the future should be co-operation and understanding. This goal can be reached if we have first: enthusiasm and inspiration for our work; second, information, and of course that information must be adequate and properly assembled; and third, we must have education. These will result in the elimination of duplication and bring about conservation of effort as well as conservation of vision.

CHAIRMAN CARRIS: I should like to tell you all the things I know about the next discussant; I mean all the good things I know about her. She is a live wire, as you will see from what she says. Miss Audrey M. Hayden, Executive Secretary of the Illinois Society for the Prevention of Blindness, formerly of Missouri.

MISS AUDREY M. HAYDEN, Executive Secretary, Illinois Society for the Prevention of Blindness, Chicago, Illinois: The Illinois Society for the Prevention of Blindness is state-wide in its scope, or at least it has been for a year and a half. Before that time our activities were limited to Chicago because we had neither the staff nor the money to support a state-wide program. So we are just a baby state organization, but I don't want to give you the impression that we are a weak baby. We are a very lusty baby and are well past our second summer.

We are supported entirely by private funds, and I feel like adding very piously, "Thank goodness for that." We are less hampered with private funds. We can be more independent about our program. We have a membership of between 1,700 and 1,800 people who are scattered throughout the State of Illinois, but most of them are centered in Chicago and most of our money and program have been centered in Chicago. Although we don't feel our program is adequate, it is very definite. The first thing we do is to enforce the Baby Sore Eye Law, which was enacted through our efforts in 1915. I don't believe the law in Illinois is as good as the law here in Missouri. It is not a mandatory law but is a permissive law. The best feature of the law is the definition of babies' sore eyes which is very wide in its interpretation. Every case of redness or soreness in the eyes of a newborn baby must be reported within six hours, either by letter or telephone. Consequently we get every case of babies' sore eyes through our organization, and in Chicago where most of the population is massed we give an hourly nursing service. Last year 853 babies were cleared through our office. We handled 65 very serious gonorrheal cases which we hospitalized, and I am very proud to say that during the last year we didn't lose a single eye in the city of Chicago, but we did lose three eyes out in the state because our state program isn't comprehensive enough to furnish the program available in Chicago where we have established our work.

We feel we cannot stop with treating and hospitalizing babies but must go back to the source and see that the parents who are the origin of this infection, are treated so that we won't be having the same problem occur in the same families over and over again. Our case workers see that the parents of these children who have the serious infections receive adequate and proper treatment.

As I say, this part of our program has been limited largely to the city of Chicago. We feel when we are prosecuting individual cases of midwives—and we prosecuted 13 midwives this last year, we aren't getting back to the source of the trouble and that, as Dr. Hardesty said, legislative adjustment is the smartest and quickest way to get past this evil. We can prosecute individual midwives from now until doomsday but we are not going to drive them out of business or raise their standards by doing that. The only way to overcome this difficulty is by proper legislative enactment which would make it impossible for an ignorant or poorly trained midwife to operate. We try to bear down on the legislative program always.

The second part of our work is state-wide in scope, and that is our school work. We have established 18 sight-saving classes in the city of Chicago. During the last year we established two out in the state. You people know what a lot of work that represented. Over 1,000 school children were examined and we had but one nurse in the field. We opened one class in Joliet and one in Rock Island the first of September, this year, and we did all the preliminary examinations for that work. At the last Legislature we were instrumental in having the law changed so that it is now state-wide in its scope; it raised the state subsidy per child from $160 to $250; it raised the standards for teaching so that every teacher had to have special training; it placed the classes under the State Department of Public Instruction so that it dignified the whole movement. This summer, fortunately, the University of Chicago, in co-operation with the National Society, gave a course for training sight-saving class teachers, in Chicago. All of our teachers in the new classes went to this course, and we have some extra ones trained in case the need arises. At the present time we are making surveys in Cicero and Rockford, and we hope to open classes there the first of January.

We also have, through the kindness of Miss Lois Adler, a glasses fund for children who do not have enough money to have glasses fitted when we find they need them. We never give entirely free glasses. We think the children will feel a sense of responsibility if they have a sense of ownership. If they are only able to give a quarter, we ask for some little contribution toward the glasses so that they own at least part of them themselves and will not be careless with them.

We feel that legislation is the most important part of our program. I told you of the enactment of House Bill 35 last winter. We were also instrumental in killing a bill in committee which made the itinerant vending of glasses legal. Next year we hope to make some adjustment on the Baby Sore Eye Law, and perhaps make it mandatory if the doctors feel this should be done.

Last year we were fortunate in securing $18,400, besides the Chicago money which amounts to $25,000, for the classes to be opened at the next biennial in Illinois. We figure that about four will be opened.

We also disseminate educational propaganda in the way of talks. We average about six or eight talks a month. We also have a moving picture film which has to do with ophthalmia neonatorum and which is called, "Let There be Light." We distributed 25,000 pieces of educational literature last year. We have also done some research on the causes of blindness in Illinois, taking 3,500 cases on the Blind Pension Roll in the state. We were able to secure about 3,200 diagnoses. Of that number, 1,700 were from qualified oculists, and the rest were from general practitioners and the pensioners themselves. This report will be published in January, 1930. We also made a study of accidental blindness, and a study on midwifery to determine the best legislative adjustment with regard to the practice of midwifery in Illinois. Most of our research is used as a basis for our legislative program.

I think Helen Keller defined very beautifully the difference between work for the blind and prevention of blindness when she said, "Of course, better work for the blind is going forward all over the country to lighten the burden of darkness, but however merry our blind children, however brave and self-reliant our blind men and women, could the utmost dreams of education for the sightless be realized, the dark is still the dark and blindness an irremediable calamity. Therefore, I say let us check this dread disease and danger. If a tenth of the money we now spend to support unnecessary blindness were spent to prevent it, society would be the gainer in terms of cold economy, not to mention considerations of happiness and humanity."

CHAIRMAN CARRIS: The Chairman feels that we have had a very fine morning. There is only one thing he regrets, that he couldn't have the words of wisdom which he knows are struggling forth from fountains of knowledge here which must be sealed up for the present. We wish we did have time for an open discussion of these topics which have been presented so interestingly, but we shall have to content ourselves with little group conferences after the meeting, because of the pressure for time.

OPENING LUNCHEON—ADDRESSES OF WELCOME

WILLIAM H. LUEDDE, M.D., Chairman

Editor's Note.—Because of the informality of the luncheon meetings during the 1929 Annual Conference, the National Society for the Prevention of Blindness has decided for economic reasons not to publish the proceedings of the luncheon conferences. The keynote of the addresses of welcome was the assurance on the part of official representatives of the state, the city, and the public schools, as well as the medical profession, that each group respectively pledges itself to the tenets of prevention of blindness and saving sight. In addition to an inspired speech of welcome on the part of the chairman, brief addresses were made by Mr. T. F. Muldoon, of the staff of St. Louis City Councellor, who was sent to represent Honorable Victor J. Miller, Mayor of St. Louis, who found at the last moment that he was unable to be present; Mr. A. A. Blumeyer, President of the Board of Education of St. Louis; Dr. C. H. Shutt, President of the St. Louis Medical Society; Dr. James Stewart, Commissioner of Health of the State of Missouri; and Dr. Daniel M. Velez, Professor of Ophthalmology, University of Mexico, Mexico City.

The National Society for the Prevention of Blindness has in its files a complete verbatim transcription of every meeting and will be glad to extend the courtesy of reviewing its transcript to anyone interested.

Conserving Vision in Industry

H. D. McBride, *Chairman*

CONSERVING VISION IN INDUSTRY

H. D. McBRIDE, Chairman

CHAIRMAN McBRIDE: This afternoon, as you will note from your program, has been given over to the subject of conserving vision in industry. It is the intention of your presiding officer to be brief and to give just a short background from which these papers may better progress.

The attention to conserving vision in industry has, of course, followed the change from production by individual workers to the development of mass production by power and machine. Next, we had the various workmen's compensation laws, adopted now by some 40 states, which have focused attention on industrial accidents and the fact that industry must bear a proportion of the additional expense and the economic loss caused by such accidents. That, in turn, has been followed by very effective measures for the prevention of accidents. The motives, therefore, thus far, have been largely defensive. But since the World War, taking that as a broad starting point, there has been recognized in industry something a little bit more than a defensive attitude—and I think this new motive springs from the third chapter of Genesis as to whether I am my brother's keeper.

I like to look upon this phase of work as somewhat parallel to the general subject of public health. In our industrial accidents, of course, we have something that is emphasized, something that attracts attention in the same way as does public health work in preventing epidemics and contagious diseases. There is, of course, the other broad field in public health work of improving physical fitness and the health of the worker or the individual, as compared with the educational work, the corrective work done in connection with public health work.

I think I can say to this group without fear of contradiction that industry has changed in the last few years from the defensive attitude to one of giving more and more attention to protection. In other words, industry has realized the necessity for prevention of accidents,—the prevention of these troubles that lead to other more serious troubles.

With that in mind, we are first to hear the results of a trial survey made in St. Louis, to be presented by Dr. William F. Hardy and Mr. A. P. Thursby of St. Louis. Dr. Hardy.

A Trial Industrial Survey

William F. Hardy, M.D., and A. P. Thursby
St. Louis, Mo.

The one word accented in the name of this organization in so far as I am concerned is prevention—"The National Society for the *Prevention* of Blindness." Prevention should be the keynote in industry in all medical affairs, but for our immediate consideration the ophthalmological aspect in particular. The doctrine of prophylaxis for prevention has always appeared to me to be as logical when applied to injury as to disease. In industry this must take into consideration the human as well as the mechanical element. It is proper that machinery be equipped with safety devices but it is as equally important that the workman be equipped physically and ocularly for his job. The square peg in a round hole in industry is costly to employer and unsatisfactory to employee. But this is not all. Granted a workman is fitted temperamentally and by skill and experience for his work he may yet be below par in efficiency due to some physical defect and for our purposes, let us say, some visual defect. After a time, practice and experience develop automatic movements in a worker which we recognize as skill. Long after a latent ocular defect has become manifest this workman may still perform satisfactory work but he has become a hazard both to himself and employer. A slight miscalculation, a small error of judgment occurs, and the potential liability becomes an actual one.

In industry every normally sighted person reaching the age of 50 becomes a potential hazard due to presbyopia. The ametropic individual reaches this status at an earlier age, often very much earlier. Yet by reason of experience and skill the employee between 45 and 50 who has been years at the particular task is most valuable to his employer, other things being equal.

Organizations have sprung up in recent years supposedly for the conservation of vision but operating on a plan which is distinctly commercial in appearance notwithstanding the fervent denials of the proponents and at times the vociferous protestations of altruistic motives. The sooner all of us frankly admit that altruism is not the sole motive in prevention, the better. Everything worth while costs something whether in money or its equivalent. There is no quarrel with any man for receiving a fair compensation for an honest and competent service. Competent connotes qualified; a service to be good must be administered by a qualified individual, must be honest and must be permeated through and through with good judgment. It must be discriminative. Why put glasses on a ditch digger or a stoker with 20/40 vision, for instance, when sweat and grime will very quickly reduce his vision through them to 20/60 or less. In the first place he would get no practical benefit and in the second place he would not wear them. It would be an instance of love's labor lost. In other words the visual requirements of workmen are of prime importance in making a survey. To carry the illustration further, a quarter diopter cylinder might conceivably make a great difference in a skilled workman doing fine work. The sum and substance of it all is that the prescribing of a lens should be divorced from the possibility of pecuniary benefit of the examiner. Hence the surveys as usually conducted fall short of the ideal in this respect. The lay employer may contend that he is not concerned with ideals but with practical results. As long as he is not paying anything for the survey and a certain benefit results from it he is content. The medical profession in the past, having offered nothing in lieu of the non-medical survey, leaves the employer with the best of the argument. But why should a firm or organization accept, to say nothing of expect, a gratuitous service? It is contrary to all of their experience in business. In a purely commercial deal they would view with suspicion anything obtained for nothing. They know or should know that somewhere down the line someone is paying.

Industrial surveys are not new, but one by ophthalmologists is somewhat of an innovation. Eye physicians have been aware of the activities of lay organizations but nothing has been done about it, much the same as Mark Twain remarked about the weather. In general, surveys have been conducted by more or less qualified persons, very frequently the less qualified. It is not a biased opinion to hold that medical examinations should be done by medical men. This is as true for ocular examinations as for any others. Personally I feel that a nurse or layman, be he or she optometrist or not, cannot substitute for the medical practitioner. A recognition and proper appreciation of pathological conditions is beyond the ken of nurse or layman. Such a simple thing as the estimation of vision is frequently if not usually inadequately done by the non-medical observer. That eye physicians have not made a move in industrial work is a source of surprise to some lay organizations. In the last issue of *Guildcraft*, the official publication of the Guild of Prescription Opticians of America, there appears an editorial by H. L. Purdy of New York, on this subject.,

It is manifestly impractical for established eye physicians to make rapid surveys of industrial plants even with the help of nurses and opticians. If willing to do so they have not the time and can ill afford to neglect their private practices. The work cannot be carried on by volunteers. It must be a compensated service. Any plan to gain widespread attention of plant officials must show an increase in efficiency of employees, a decrease in accidents, a lessening of waste, better co-operation of employees, and a decrease in liability insurance. All of this reduced to the least common denominator means a saving in money. Convince employers that a greater saving can be affected by proper medical supervision than exists at present or under non-medical surveys and the latter will sink into innocuous desuetude. The medical profession has always stood out against contract practice yet a great amount is being done. Possibly with the mutations of time a revision of the attitude on contract work will be brought about. Any agreement between industries and physicians must partake of the nature of a contract.

Is there a plan or has anyone a suggestion as to how ophthalmological surveys may be carried out? Large industries usually have a medical staff or examiner and gross visual defects are likely to be noticed and referred to ophthalmologists for correction. It is the medium sized and small plant mostly in need of medical supervision. What benefit would accrue to the employer from an ophthalmological survey? (1) For a nominal sum the factory official would know and have a record of the ocular status of every employee and a chart would be on file valuable for future reference if needed. (2) Employees could be assigned to tasks best suited to their ocular condition. (3) Efficiency would be increased and output speeded up. (4) Loss from waste and spoiled material reduced. (5) Loss of customer's business minimized due to imperfect finished product passing inspection. (6) Reduction in law suits, both from fewer actual injuries and from alleged injuries. At present it is possible for an unscrupulous individual to sell his physical defect or disease to a number of companies by the simple expedient of changing his name with his employment and alleging an injury. Examples of this are too numerous to mention,—not only can it be done but it has been done and is being done. (7) Lowered cost of insurance. There is no need to labor this point.

The benefit to the employee is obvious. His attention is called to any disease or defect and if remediable he is advised to have it treated and referred to a competent ophthalmologist. Time lost from work would be lessened and his efficiency and value to the company increased.

Unless a plan will show a balance over and above the cost of employment of a physician it will not gain much headway. If increased efficiency and saving on waste alone would not amount to the cost of a medical survey in a plant of the size suggested, I badly miss my guess. Most of the benefits we must admit are intangible. But $1,000 preventable eye injury alone would pay for several years examinations. Not all injuries are eye injuries, the ratio varying all the way from 10 per cent or less to 50 per cent or more; many injuries which we might term collateral injuries can properly be attributed to faulty vision.

Whatever progress is made along the lines of ophthalmological surveys must start with the appreciation of employers of the need of such. In the final analysis the employer pays for everything whether it be for medical supervision, loss of time, waste of material, compensation or indemnity. The employees are more or less apathetic and the insurance companies are not highly interested since their rates are automatically adjusted to take care of the losses. It all comes out of the employer's pocket. It is the employer who must take the initiative and it is the function of the ophthalmologist or a vigorous society such as the National Society for the Prevention of Blindness to awaken or stimulate that initiative.

The survey or examination conducted by my associates and me was undertaken without hope, thought, or expectation of, remuneration, direct or indirect. It was purely a trial or experiment. It demanded an expenditure of time and energy which we could not adopt as a regular thing. It revealed numerous difficulties, conditions and reactions, some of which were unexpected. There was no manifest antagonism on the part of the employees and the co-operation and assistance of the plant was most gratifying and unusual. Many of the employees wondered what it was all about. Some frankly asked what and where was the graft. To one who so expressed himself I said, "Can you conceive of anyone doing something for nothing?" and his reply was, "Absolutely not." Some were amused, some bored and others no doubt with mental reservations went through with the examinations deciding to do as they chose. This is reflected in the fact that but 17 of the 46 prescriptions written for glasses were known to be filled. The great majority, however, accepted the service in the proper spirit and co-operated to the fullest extent. Only one objected and declined to be examined on the grounds that it conflicted with her religious beliefs.

What is to be done with examinees needing refraction? Frankly I do not feel that it is within the province of the employer to provide refraction for the employee. If by the examination a need for refraction is revealed, the employee's attention should be directed to it and refraction recommended. The employer need go no further. When correction is imperative, in those cases with poor vision and those requiring the highest grade of vision in hazardous occupations and where subnormal sight may ruin material, the employer has the moral right, it seems to me, to insist on thorough refraction by a competent and reputable eye physician. Paternalism in industry is neither advisable nor desirable.

The survey upon which this report is based was conducted at the Buck Stove and Range Co., of St. Louis. The type of work can be classified as semi-hazardous in certain departments. Four oculists participated in the work: Drs. Wiener, Green, Mason and myself. Assistants furnished by the four optical firms in St. Louis, members of the Guild of Prescription Opticians: Mr. Martin of A. S. Aloe Co., Mr. Budenholzer of A. P. Erker & Son, Mr. Forest of Geo. D. Fisher & Co., and Mr. Gerrichton of A. P. Thursby. Mr. Eugene Erker and Mr. A. P. Thursby were also in attendance. Examinations were made on March 19, 20, and 27. Eighty-five were examined the first day; 66, the second; and 83, the third; a total of 234. The third day a trip of observation conducted by Mr. Januzzo was made through the plant, the object of which was to observe the working and lighting conditions as existed in the various departments of the plant and to form a basic visual requirement that could be reasonably expected to meet the needs of each department. It is intended to make a report on this later.

Great credit and appreciation is due Mr. Januzzo, manager of the plant, for his energy, enthusiasm, co-operation, and whole-hearted support and assistance. He represents the broad, far-seeing type of official. By arrangement with Mr. Januzzo employees needing refraction were sent to the ophthalmologists' offices for refraction on the company's time. It was managed so as to interfere as little as possible with work at the plant. To enable the ophthalmologists to judge of the visual requirements and working distance of the employees, a chart was furnished by Mr. Januzzo. This was deemed a most important aid and a lantern slide of it will be shown you (Lantern Slide of chart). The personnel of the plant was made up of officials, office clerical help, 85 moulders mostly foreigners doing hazardous work, 25 negroes doing semi-hazardous work and the balance skilled and unskilled labor, drivers, etc. The expense of the preparatory work was borne by the Guild of Opticians of St. Louis.

The preliminaries leading up to the trial survey which were quite extended, need not be entered into at this time. Suffice it to say that the greatest courtesy was shown the joint committee of oculists and opticians by the Buck Stove and Range Co. Normally this plant employs between 250 and 300 persons. Due to departmental shut downs all were not seen at the time of our examination the final count being 234. With reference to age the following table shows the various numbers in decades.

Eye Conditions According to Age Groups

Analysis	234 Employees	
Found normal	74	
Pathology	53	
Refraction needed	103	
Found with negligible errors	33	263
Duplications in pathology and refraction		29
		234

Analysis by Decades

Age of—Years	Under 20	20+	30+	40+	50+	60+	65+	Totals
Employees	23	63	48	63	26	9	2	234
Pathology	5	7	9	16	7	6	1	51
Refractions (Office)	9	15	16	29	12	6	2	89
Glasses ordered	6	7	8	14	5	4	2	46
Glass ℞ filled								17
Own glasses found O.K.								22

Analysis of Vision Without Correction

	20/15	20/20	20/30	20/40	20/50	20/70	20/100	20/200	12/200	10/200	8/200	6/200
R. E.	13	89	66	20	14	12	10	6	1	0	0	1
L. E.	14	96	65	19	8	11	6	4	0	1	1	2

Hyperopic	5	Myopic	0
Simple hyperopic astig.	4	Simple myopic astig.	4
Hyp. with hyp. astig.	11	Myopic with myopic astig.	5
Mixed + sph. ⊃ − cyl.	9	Mixed — sph. with + cyl.	2
Presbyopic only	6		
Bifocals prescribed	12		

Sex			
Male	203	Glasses prescribed for 40	20%
Female	31	Glasses prescribed for 6	20%

The examination covered the estimation of distance vision without and with glasses if any and of near vision (reading distance). The visions were taken by optician assistants. The ophthalmological examination covered inspection of eyes, lids, ocular movements, convergence ability, pupillary reflexes for light and accommodation, equality of pupils, presence or absence of corneal scars, dacryocystitis, growths or any abnormal or pathological condition capable of being demonstrated by external observation. Tension of each eye-consisted of noting the appearance of the media, the condition of the ball to the finger was noted. The ophthalmoscopic examination optic nerve, peri-papillary and macular regions. Unfortunately a test for color blindness was not made. With two opticians and two oculists working in a team the employees were passed through at an average speed of one every two minutes and 40 seconds. Virtually only the high points can be touched at this speed yet a good general idea was obtained. When refraction or treatment was thought advisable the record was so checked. The total number of refractions advised was 103, of whom 85 were actually done. Several were started but not completed. A total of 46 prescriptions for glasses were written and the records show but 17 of these were filled. Prescriptions for glasses were given to six women and 40 men, in each case being 20 per cent of the number examined. The time required for the refraction of 85 persons is considerable, therefore, refraction cases as before stated were sent to the offices of the four ophthalmologists engaged in the work. The tabulated results are best depicted by lantern slides. As was expected the examination revealed pathological conditions worthy of being recorded. In all a total of 51, or 22 per cent, was tabulated. This is a very significant and illuminating result of the survey and graphically indicates the value of a medical survey as contrasted with a non-medical one. We have always vigorously contended that a survey by non-medical men, even though honestly and efficiently done so far as their limitations would allow, fell short of the requirements in this very important respect.

What deductions are to be drawn from this trial industrial survey? The following are my personal opinions and may or may not be the consensus of the committee having the matter in hand: (1) Such surveys should be conducted by a physician, preferably an eye physician. (2) The work cannot be successfully carried on by volunteers. Physicians should be engaged and compensated for their services. (3) Some equable arrangement may be brought about between employer and physician. (4) The number of employees showing errors of refraction is apparently large but probably no greater than would be found in an equal number of people met with on the street, taken as they come. (5) Those requiring glasses are reduced in number since low degrees of errors are excluded. The occupation and nature of the work done are taken into consideration, resulting in a further reduction. (6) The age incidence has an important bearing on the number of refractions. (7) Presbyopes with glasses giving them good vision and worn with satisfaction to the wearer should not be disturbed even though the correction may be improved upon. (8) Those doing work demanding good eyesight should be required to wear proper glasses if glasses are indicated. (9) Those doing coarse non-hazardous work need not wear glasses if there are no subjective symptoms and the employee is disinclined to wear them, provided the vision is not too low. The question of good judgment should decide the matter; whenever possible the co-operation of the employee is desirable. (10) An important feature is the proper assignment of workmen to tasks with reference to their visual requirements and capabilities, thereby preventing waste of material. (11) The prevention of accidents is most important of all. It is assumed that all the mechanical safeguards and protective goggles have been provided. (12) Non-medical surveys can only touch upon one phase of the situation and that many times very inadequately. (13) The finding of pathological conditions in 22 per cent of all those examined forcibly demonstrates the point we have repeatedly made that surveys should be conducted by eye physicians. (14) The prescribing of glasses should be completely divorced from all commercialism and from exploitation of the employee. (15) Some of the refraction must be done under cycloplegics and all should be conducted in the offices of competent ophthalmologists. It is not the province of the employer to furnish refraction, neither is it advisable. His duty ends in recommending it or, in some cases, demanding it. He is no more obligated to do so than he is to provide food, raiment and shelter. This is presumed to be provided for by the payment of a living wage. (16) All applicants for positions in industries should have an ocular examination. This would avert an enormous amount of trouble. It is cruel and inhuman to exclude a man from the opportunity of earning a living because he has some ocular defect. He may still do very effective work despite his imperfection, if properly placed. The important thing is to have his ocular status a matter of record so that he may be intelligently, justly and humanely classified and handled.

CHAIRMAN MCBRIDE: Thank you, Dr. Hardy. If there be no objection, we may defer the general discussion of these papers and reports until the completion of the three. We will now have the privilege of hearing from Dr. Sidney Walker, Jr., of St. Luke's Hospital, Chicago, as to the care of the eye after an injury.

I am just going to say before he gets up here, that I am reminded of a fellow citizen of his city who, in writing on this subject not long since, pointed out, in referring to the workman who lost his eyesight, that you could get false teeth that would do a good job, you could get a false hand or leg that would do a pretty good job, but you couldn't very well get a satisfactory false eye.

Rehabilitation of Injured Eyes

SYDNEY WALKER, JR., M.D.
Ophthalmologist, St. Luke's Hospital, Chicago, Ill.

The old adage goes: "An ounce of prevention is worth a pound of cure." Hence, before discussing rehabilitation of injured eyes, it seems to me that I should dwell for a moment on preventive measures. There are many factors to be considered and I shall attempt at this time only to touch upon the high points.

A more than cursory examination of the eyes at the time of employment is essential, and I suggest that examination should not only include visual tests, but also superficial and deep pathology; and in my opinion this should also include inspection of the nose, throat and teeth along with a superficial inspection of the general system. My reason for the above suggestion is that the nose, throat and teeth are intimately related to the eyes, especially the first two, and give rise under certain conditions to many ocular diseases.

Periodic health talks by the foreman, shop surgeon, or from outside sources are excellent as an educational campaign for the average man. Employees should have any gross refractive errors corrected, and minor ailments should not be disregarded. Insistence should be put upon the wearing of goggles during the time spent in the shop and all safeguards about machinery, and especially emery wheels, boring mills, etc., should be inspected regularly.

The measures I have named are more or less passive, yet active measures should not be neglected. In this category, I feel that it is most important to relegate the "shop oculist" far into the background. The handy man about the shop with his dirty pen-knife or like instrument, as an act of mercy to alleviate the suffering caused by a foreign body in the eye of a fellow workman, will attempt to remove the particle. From actual experience I have known of many eyes lost by such ministrations. It is not going too far to suggest that the nurse be also placed in approximately the same category, and if all cases, whether major or minor in type, be given first aid and first aid only by the general surgeon, the majority of bad end results would be lessened. It is with no intent of criticism that I make the suggestion that the general surgeon sometimes does more harm than good when he attempts to go beyond his scope in the treatment of an injured eye.

In discussing the rehabilitation of an injured eye, we have many types of disability to consider. Owing to the length of this paper, it is impossible for me to discuss them all, hence I shall limit myself to the more important and familiar types.

There are many one-eyed men earning a good living today, and in most cases equally with their two-eyed brothers. The number must be large, and although I can give no statistics, possibly a personal statement will help some. I myself blushingly admit enucleating between 30 and 40 eyes each year. The biggest problem in these cases, it strikes me, is to get rid at once and for all time of the resulting inferiority complex, or, I might say, the self-consciousness which follows enucleation of an eye. And excellent cosmetic effect can be obtained in the majority of cases and, including this and the proper refraction of the remaining eye, the patient is made to look and feel very nearly like he did previous to his injury.

Through the year I see a large number of men with traumatic cataracts. Possibly I see more than my colleagues in other states owing to the fact that the reading of our industrial laws allows such things to exist. In our state a man is paid for total loss of an eye if he has a cataract resulting from injury. Should the cataract be removed, no benefit accrues to the insurance company by reason of further treatment, the state having ruled that glasses are the same as crutches. The man gets as much as if his eye had been removed. He is either too negligent or cares little about improving the condition. He has a chance in many cases to have a portion of the sight restored, but from my experience it appears that the majority of these people go about satisfied with the way our state has dealt with them. Just across the line in the state of Indiana, credit is given to the insurance company or corporation for vision obtained by means of glasses following the cataract extraction, hence we do not see such a condition of neglect existing. This is a much better law as both the man and the insurance company benefit, and especially the injured man.

Corneal opacities, astigmatism, and all refractive errors secondary to injury in which the vision can be increased by means of glasses are ruled out in Illinois so that most of the eyes which suffer from injury and result in the above named conditions do not get the after care which they should have. In conditions following burns of all sorts with resulting scars of different types on the cornea, the use of certain drugs over a long period of time is essential if the maximum amount of vision is to be obtained. Settlements in these cases are often too early reached by the ambulance-chasing lawyers, and the man suffers in the end.

Syphilis plays not a minor rôle in eye injuries. Moreover in many cases it is an indirect cause of frequent bad end results. Courts have rules in a large number of cases, bad results from trivial injuries ensuing where syphilis is present, that the condition was due to aggravation of a pre-existing one and hence the employer or insurance company must hold the bag. I cite this only as one example of the benefit from many angles to be derived from examination of the eyes, both superficial and deep, before employment.

Diplopia, or double vision, is of many different types, a large percentage of which is due to syphilis. That, however, which follows skull fractures or brain lesions should deserve special attention, and even though one or several muscles be involved, much can be done for these cases. It is altogether too often that such men are paid off and nothing done to correct the deformity and the sometimes dangerous condition they are left in. Such men are prohibited from any work above ground and even from ground work. On account of the difficulty in correlating objects, they are a distinct menace to themselves and to their fellow employees.

Much has been said and written about the dire results of sympathetic ophthalmia. I shall not attempt to enter into a discussion of the subject as it is too voluminous. I hold and have held for some time that this condition can be and should be eradicated by process of law. It falls into the same category as ophthalmia neonatorum. I have seen considerable of the former disease and have read much, and it is my opinion that a constructive law with sharp teeth in it which would affect all parties concerned would soon put an end to this condition. Intelligent treatment as soon as diagnosis and the early removal of the blind irritable eye would absolutely efface such a calamity. But like birth control and other futuristic measures, it will probably take many years before legislation is enacted which will actually benefit certain ones of the human race.

I shall touch lightly upon the subject of trachoma, as the sanitary measures used in the average machine shop or factory have done much to eliminate the possibility of transferring this disease. We also know what government and state health authorities have accomplished, and education of the masses along the lines of popular medicine has done much to lessen our losses of vision from this disease. We have still much trachoma in the state of Illinois. Fortunately it is limited to the extreme southern section. Some cases have migrated to Chicago, and in a quiescent state have obtained employment. You need but imagine what complications arise when an eye so affected receives an injury.

It has been proved many times that the will to do accomplishes many difficult tasks. Men with badly injured eyes who cannot be rehabilitated to the condition in which they previously were, or anywhere near it, can—if the proper interest and co-operation be shown—be placed in a different type of occupation. Their earning power need not be greatly decreased. This state of affairs need be only of a temporary nature until such time, in certain cases, they can again resume their former type of work. In other cases the change must be permanent. Hence it seems to me that it is not only the function of the State Industrial Commission to adjust the monetary claim of the man who receives an eye injury arising out of and in the course of his employment, but they have the further and, to me, the greater function. This is probably the humanitarian side but should be included in the settlement of claims, and that is the placement of the injured man in a position or under conditions where he can serve again as a useful member of society, retain his self-respect and keep his morale.

CHAIRMAN MCBRIDE: The next topic on the program will prove especially gratifying and promising I am sure. It is a summary of a joint study made by the National Society for the Prevention of Blindness, and the National Safety Council, to show what progress is being made in the prevention of eye accidents in industry. That will be presented by Mr. L. H. Carris, the Managing Director.

Eyes Saved in Industry

Lewis H. Carris
Managing Director, National Society for the Prevention of Blindness,
New York, N. Y.

We are always glad to co-operate with the National Safety Council and the local branches of that Council. The program of the National Safety Council if put into full effect would, of course, eliminate all of the hazards in industrial occupations, but they are glad to have our Society pay especial emphasis to the prevention of accidents, eye accidents, in industry itself.

As you know, the National Society published a few years ago a volume on the eye hazards in industrial occupations which had a rather large circulation. Of course, in the propaganda movement such as our own and that of the National Safety Council, it is necessary to keep continually educating the public, and in co-operation with the Council, Mr. Louis Resnick, of our Publicity Department, who was formerly an employee of the National Safety Council, has prepared for popular consumption a monograph which has an approach that I want to lay before you here and secure from you, if I can, your reaction.

So far, great emphasis has been laid upon the eyes that have been lost in industry. This particular pamphlet lays emphasis upon the eyes that have been saved in industry. This was made up of reports of data obtained from a large number of industrial concerns and attempts to compile the answers to certain questions, a few of which I will read to you.

"How many employees in your plant had one lens in their goggles spattered or pierced by flying metal while in use during 1926–1927? How many employees in your plant had both lenses of their goggles shattered or pierced by flying metal while in use in the same years? How many employees in your plant had one goggle lens spattered with molten metal or injurious chemicals while in use during the same years? How many employees in your plant had both goggle lenses spattered with molten metal or injurious chemicals while in use? How many employees in your plant had one goggle lens pierced or shattered by flying tools or flying objects other than fragments of metal while in use? How many employees in your plant had both goggle lenses pierced by flying tools or flying objects other than fragments of metal while in use during those years?"

The next statement is one I wish you to pay particular attention to, and critical attention if you so desire, because the whole paper is built upon this assumption. It is assumed that an object which hit a goggle lens with such force as to pierce or shatter the lens would most certainly have so damaged the eye, if the goggles had not been worn, as to cause complete or nearly complete loss of vision. It was assumed that every instance of a goggle lens being spattered by molten metal or injurious chemicals represented an eye saved. The question of whether this assumption was warranted was submitted to the men responsible for accident prevention in five of the largest industrial organizations in America and there was a consensus of opinion that that assumption could be made. However, the Executive Committee of the National Society is anxious to have a reaction to that particular question. Of course, it must be understood that in propaganda work like this we can perhaps make stronger statements than would be made in purely scientific papers. Nevertheless, we believe we must maintain the truth and not make statements which are not justified.

You will be interested in some of the findings with reference to the number of eyes which according to this method have been saved. The figures show that during this year under consideration 283 men had the even more terrifying experience of being struck by a large piece of metal with the result that both lenses of their goggles or head mask were shattered or pierced, terrifying at the moment but a happy experience for those who at other times had engaged in the same occupation without taking the precaution of wearing protective devices.

During this same year there were recorded among those 583 plants 1,003 instances of one lens in the goggles or head masks worn by employees at work being spattered with molten metal or injurious chemicals. During the same period in these plants 1,614 men and women had both lenses of their goggles or head masks spattered with molten metal or corrosive chemicals while they were at work, and so on, giving as large a number of instances for each of the other classifications.

There can be little doubt that in each of these 7,431 instances, that is a summary of all of them, the injury would have led to complete loss of vision in one or both eyes, or to very serious injury of the eyes, this despite the great progress that has been made in recent years in the development of electromagnets and other devices for withdrawing metal fragments from injured eyes and despite other progress in the science of ophthalmology. Complete tables are given here of answers to these questions.

Then goes on another assumption which I think is quite important in this particular, and that is to show the financial gain which has resulted to employers through the use of protective devices, and according to moderate figures in these plants a number of millions of dollars have been saved in the two years from compensation and, on the other hand, a very great gain to the employees themselves.

I have submitted just a few of the conclusions of this paper to this audience, at least one present who will participate in the discussion has read the paper, and I believe some others have. The object of this meeting, as I said in the beginning, is to provoke some discussion, as much discussion as time will permit, as to the feasibility and desirability of the publication of this joint study by the National Society for the Prevention of Blindness for wide distribution.

CHAIRMAN McBRIDE: It has been suggested that Dr. Patton of Omaha would read the discussion on this particular paper.

Discussion

JAMES M. PATTON, M.D., Professor of Ophthalmology, College of Medicine, University of Nebraska, Omaha, Nebraska: Mr. Resnick has presented a subject which is of interest to all who are in any way associated with the general program of visual conservation. It has been necessary in the past to stress the negative phase, that is results of failure to make use of available ocular protection and thereby stimulate co-operation on the part of both the employer and employee. Nevertheless, consideration of the positive side, namely the eyes saved through the use of protective measures, is more encouraging and offers some recompense for the efforts put forth by those who are responsible for the success of the program.

The facts presented by Mr. Resnick have in a minor way been brought to my attention through contact with the Omaha branch of the American Smelting and Refining Company, where as high as 600 men, many of them unskilled laborers, are employed in operations carrying more or less occupational risk. Until about three years ago the department of safety had been unable to get authority to establish an adequate program of ocular protection. There were a considerable number of minor eye injuries, with one or more serious ocular casualties each year. Early in 1927 one of the popular young employees was struck in the eye by a flying nail, requiring enucleation of the globe. The accident aroused considerable interest throughout the plant, both of executives and employees, and an order requiring use of goggles in all operations about the plant was secured and rigidly enforced. I have seen but one severe ocular injury since the rule went into effect, namely a chemical burn which eventually healed without reduction of vision. The employee had, against definite orders, removed his goggles.

Goggle replacement ran as high as 40 or 50 pairs in some months, but I was unable to get the actual number which were sufficiently damaged to come under the group presented by Mr. Resnick. I have several pairs in my possession, which undoubtedly prevented the loss of one or both eyes, and the safety department has a rather large collection on display for educational reasons, for which purpose they have proven very impressive; but I was unable to get the exact number. However, considering conditions now with those previous to the establishment of the compulsory use of protection, the figures compare very favorably with those presented by Mr. Resnick.

But it is not this phase of the subject that I wish particularly to emphasize. Through executive authority, protective devices and safety campaigns and contests, corporation employees are fairly well protected, at least they can be if they will avail themselves of the means at hand. It is the large unorganized group of industrial workers, the owner or employee in the small shop or garage, farmers, housewives, laborers in small and perhaps poorly supervised construction gangs, and even school children who are potentially members of this group, form the large proportion of those who consult the oculists for the care of major ocular casualties. In a recent checkup of the major ocular traumas which we have seen in the last few months, of about 50 cases considered, less than 10 per cent were in the group considered in this study. The remainder were unorganized mechanics, garage workers, merchants, farmers, 18 per cent; road construction laborers, 20 per cent, etc.; while at least 28 per cent were children of school or pre-school age. While technically the last named group might not be included in an industrial survey, potentially they are entitled to the same, or perhaps more, consideration than those of the adult industrial group.

This unorganized group just mentioned, profit by protection as well as the strictly commercial or corporation class. For example,—a farmer, lens struck by a flying pebble, glass shattered, eye not injured; another,—lens pierced by a nail which glanced when struck by a hammer, the lens undoubtedly saving the eye from destruction; a high school boy, right eye damaged by intraocular steel, induced with great difficulty to wear protecting spectacles; returned in a few weeks with the lens over the good eye shattered by a steel fragment, eye uninjured. I do not have data as to the number of similar cases that we have seen, but they amount to a considerable number each year.

In this connection allow me to urge your co-operation in emphasizing the importance of insisting that all persons, regardless of age, sex or occupation, who have but one useful eye, should wear protecting glasses constantly during their waking hours. The objection that eyes may be injured by broken spectacle glass is no longer valid, as a thoroughly practical non-shattering optical glass is easily obtainable. At least one of the largest American manufacturers of optical glass informs me that it is conducting active research to improve further the quality of this product.

We must not be satisfied with a program of education which is limited to the corporation group alone. The results of the National Society's survey should be given the widest publicity. The general public should be repeatedly informed, in such ways as will be most effective, of the physical and financial benefits of ocular protection.

Chairman McBride: Thank you very much, Dr. Patton, for that contribution.

We have in St. Louis a very effective organization in the St. Louis Safety Council, the president of which has favored us with his presence. I will ask Joseph T. Davis if he wouldn't care to enter into this discussion.

Mr. Joseph T. Davis, President, St. Louis Safety Council, St. Louis, Mo.: Mr. Chairman, Ladies and Gentlemen: If I may be permitted, I should like to preface my remarks with a brief statement as to the nature and character of the St. Louis Safety Council, and what it is doing in the industrial field along the line of this discussion, so that you may be in a better position to judge what I am about to say, and determine what weight may be given to my statements.

The St. Louis Safety Council is a voluntary organization sustained by voluntary efforts and contributions. It has a total membership of about 1,600 individuals and corporations. Approximately 600 or 700 of this membership are industrial, public service and other corporations. So as to disabuse the mind of any person who may have the impression, which I have so frequently heard, that this organization is sustained by insurance companies, I desire to say that this is not true as to the St. Louis Safety Council. Less than one per cent of the sustaining efforts of the 1,500 or 1,600 members come from the insurance companies, financially or otherwise.

It may be of interest to know that in our Inter-Plant contest conducted by the St. Louis Safety Council during the past ten months, which involves at least 35,000 employees, there have been but two cases where there has been a loss of an eye, and only one out of 35,000 employees where 50 per cent vision of one eye has been destroyed. One of these eye losses occurred in a foundry, one in a shoe factory, and the 50 per cent destroyed vision occurred in a machine shop. This will give you some idea of the range of work being done in St. Louis.

Unfortunately, I have not seen a copy of the report referred to by Mr. Carris, and consequently I am not in position to discuss it. I desire to say, however, that there is much benefit to be derived by the eye surveys, such as described by Dr. Hardy in his interesting paper and talk this afternoon. I heartily agree with Dr. Hardy's paper in substance.

In view of the fact that the Safety Council is a non-commercial organization and does not advance the cause of any profession or business, I refrain from taking sides with one group or the other in determining which should make the eye survey, but in substance, I endorse what Dr. Hardy has said and agree with him that tremendous benefits are derived by employer as well as employee by having these surveys. I do believe that we must look at this matter from a practical point of view in this, that there are thousands of employees in various industries engaged in hazardous undertakings where their eyesight may be affected by the nature and character of the work in which they are engaged. There are some employees who have defective vision engaged in work which becomes more hazardous by reason of this physical defect and should not be permitted to continue without having this condition remedied. Others should be transferred to other positions.

I recall one instance, of many, in our experience here, where a test or survey showed a man engaged in driving a truck upon our streets, had such defective vision as to make him a dangerous driver. He should not have been permitted to drive a truck upon our streets and highways. When the employer's attention was directed to this defect, the employee was promptly assigned to another position where the work was of a character which could be done with a greater degree of safety to himself and others, and the employee was further protected by having glasses prescribed for him.

I desire to view this subject of mass survey from a practical point of view based upon years of experience in dealing with men and women engaged in the industries. You must realize that you as doctors, I as a lawyer, and someone else as a dentist, see these things from a different point of view. For instance, I as a lawyer, may say, to some of the doctors who seek relief after having made a bad deal "You should have consulted your lawyer before you entered into this undertaking." The dentist may say, "Mr. Davis, you should have looked after your teeth some time ago. If you had seen your dentist and had permitted an examination of your teeth, you would have saved yourself a tremendous amount of trouble, annoyance and pain." The eye doctor may say, "Mr. Davis, you should have had your eyes examined and tested to determine whether there was any weakness or defective vision." Human nature is the same, whether among professional people or employees in the industries. The trouble is that we are all so absorbed in our profession or work that the little tooth does not disturb us until we suffer pain. Our eyesight fails to attract our attention until we discover some serious defect of vision or until we have trouble with our eyes. You, as doctors, do not begin to realize the necessity of the lawyer until trouble arises. This is the whole story with the average individual.

This is the way, in my judgment, we must look at the subject of eye surveys in the industries. We must determine how we can reach the average individual engaged in industrial work, who has given no thought to the examination of his eyes. That is the situation among the 35,000 employees I have referred to, who are employed in the plants now engaged in the contest to establish records of no-loss of time accidents. The average workman does no extensive reading and has little occasion personally to test his sight, and, therefore, does not realize that there is a defect in his vision. How are you going to reach those men?

This condition can be met and the employees can be interested, through properly conducted mass surveys in the various industries. Whether these surveys are to be conducted by the doctors or by some other person or organization, I am in no position to say or recommend. I do not know how you are going to do it, but I will say that you, as members of this Society, are just as vitally interested in avoiding blindness resulting through accidental means as are the members of the St. Louis Safety Council. The members of our Council have open and free minds on this subject. We will be glad to co-operate with you. I believe that a proper solution of this problem could be worked out through small committees or groups of both organizations. We shall be glad to appoint a committee to represent the St. Louis Safety Council, to meet and co-operate with a like committee of your Society with a view of solving this important problem.

In the matter of using goggles by workmen, I desire to say that the St. Louis Safety Council is constantly advocating and preaching the necessity of goggles, where the character of work requires such protection, to save and protect the eyes of all men engaged in the industries. Each year we conduct a school for industrial foremen and supervisors during seven successive weeks at night, for the purpose of instructing them as to the practical methods of preventing accidents and in the matter of saving their lives, their eyes, their limbs and their bodies. These schools have an average enrollment of approximately 2,500 men and women.

In conclusion, permit me to say that the St. Louis Safety Council stands ready at any time to offer such assistance and suggestions as it can, and if it is the wish of this Society to appoint a committee, we will be glad to co-operate with you and render every assistance possible because we are vitally interested in the subject under discussion.

CHAIRMAN McBRIDE: Mr. Davis, we appreciate very much your contribution to this program.

I believe Dr. Davidson, oculist of the Pullman Company of Chicago, is here in the room. Would you oblige me by participating in the program?

DR. HERMAN PORTER DAVIDSON, Oculist, Pullman Car and Manufacturing Company, Chicago, Ill.: Ladies and Gentlemen: I am a contract oculist. I spend three hours a day in the plant. I have had and am still having a good many of the problems that we have been talking about today. I started with the company in 1923. In 1925, I published a review of the visual acuity of 4,000 consecutive employees seen.[1] No attempt was made in this article to classify the cause of the poor vision found. In this survey, roughly, 29 per cent had normal vision without glasses and 39 per cent had perfect vision with glasses.

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[1] *Journal of Industrial Hygiene*, Vol. VII, No. 6, June, 1925.

What Dr. Patton said about unbreakable glass is true but this glass has not been perfected yet. In order to get the unbreakable glass, it is necessary to subject the glass to considerable degrees of heat, and this heat changes the curve of the glass so that it is necessary to regrind. The regrinding causes a weakness of the glass, as the heat hardens the surface only and not the center or core.

We require our goggles to be 3 mm. thick at the thinnest part and we test them from time to time to see if they withstand blows.[1] We have found that the Plano glass is more resistant to blows than the prescriptive lenses, probably because of the regrinding after heating. Some for no apparent cause are weaker than others. Two of the largest glass manufacturers tell us that they are conducting a research on this. At one time, they thought they could tell the hard ones by the way they polarized light, but unfortunately the ones the expert picked by this method shattered as easily as the others.

I am very much interested in this, and I should like to ask Mr. Carris one question, whether there have been any eyes injured in these cases that have been wearing goggles that have had corrections for their eyes; by that I mean corrective goggles. Have there been any shattering injuries to the eyes either by glass or by the missile? I have not had time to read his paper and, of course, I don't know.

What Dr. Walker says about our laws in Illinois is true. Any number of men could be benefited greatly if we were allowed to remove traumatic cataracts. I hope this will be legislated upon later and that we can give men better vision.

In 1923, when I came to the Pullman Company, 27 per cent of all the injuries that came through were eye injuries. Today, 19 per cent of all injuries that come through are eye injuries. Credit is due to the safety men who go around in the plant and preach safety and see that the men are wearing goggles, and talk to them about it. If employees say, "I can't wear them; they are too heavy; they hurt my head; I see double," and so forth, they are sent down to me with their goggles and I try to correct them as best I can. Occasionally, we do get an individual who says he cannot wear any of these prescriptive lenses.

As you know, all of these lenses are heavy. It is hard to get the pupillary distance just right, and you all know what a difference that makes in the sight. We have succeeded in our plant from 1923 to the present date in having most of our men wear goggles, and we have a regular routine. If a man who comes in is a laborer, he is given a Plano glass. If he has an error or is wearing glasses now, or if the hiring department is suspicious of an eye injury, the man is sent over to the office and I give him a prescriptive lens. In the meantime, he wears the Plano glasses until he gets his prescriptive lens.

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[1] A steel ball of varying diameters is held to an electromagnet three feet from the glass and then released by a switch. This allows the ball to fall on the glass and the glass is classified as to its resistance from blows.

Of course, it would be ideal if the oculist could see every individual who comes through, but in the kind of industry that I am associated with we are not able to do this. For instance, in one day we will hire as many as 200 men, and the next day or next week we will fire 200 men. In the plant I am now with, I have about 8,000 records, I think, and on the payroll when I left, there were about 6,000 people. I also take care of another division which has 2,000 more, so you can see as an oculist I am pretty busy. I have three hours a day to give to this kind of work.

What about prevention? During one season I see all the foremen of each plant. I go out into the plant and lecture to them an hour on the simple conditions of the eye, why we should wear glasses, what for, and give a little lecture on what the eye looks like. The thing that puzzles them most of all is that they cannot understand why they can't get a single lens with which they can see far away and close by at the same time. I can only get around that by telling them that anybody in the audience who has an inventive mind and could make such a glass would be able to make millions for himself. All he needs to do is to get something that stretches and is still transparent. I haven't heard from these men, but it satisfies them from that viewpoint.

CHAIRMAN McBRIDE: Thank you, Dr. Davidson. Folks, we have reached, then, the period of open discussion for this afternoon's program, and I believe those who have contributed to the program will be willing to answer any questions they can that may exist in your minds. If there is any further discussion between the members of the audience, I am sure we will be very glad to have it. Are there any questions?

MANAGING DIRECTOR CARRIS: To answer Dr. Davidson's question,—this record, as far as I can look through it, contains no reference to any eyes having been destroyed by the use of goggles.

CHAIRMAN McBRIDE: Dr. Royer, this meeting would hardly be complete if you failed to contribute something to it, perhaps in a summing up.

DR. B. FRANKLIN ROYER, Medical Director, National Society for the Prevention of Blindness, New York City: Mr. Chairman, I must admit that I have had very little personal experience in the field of industrial hygiene. I have been very much interested in the series of papers, and feel very much gratified that those who were invited have made such splendid contributions. The whole subject as brought up by Dr. Hardy in his survey interested me because I must plead guilty of rather taking the stand for the industrial hygienist as the kind of medical man to make all examinations and tests in the plant and have sought to enlarge his responsibilities and to have him take a larger responsibility in the conservation of vision program.

A year ago at our annual conference in New York we succeeded in having the Association of Industrial Physicians join us in a half-day program on conservation of vision. I can't help feeling, as I visualize industry, since the Safety Council movement has placed the safety engineer in so many plants, that the industrial doctor or the industrial hygienist has fallen down a bit on the hygiene job. He has ceased to take the interest he ought to take in the accident side. He has ceased to take interest in the proper lighting of the plant. He has not even kept up all of the interest that he might in first aid which is so essential in conserving vision.

With the legal provisions for workmen's compensation and the tremendous amount of paper work that comes with it, the doctor has often become so much a clerk that he ceases to function very much as a preventive medicine man in the plant. I hope that the time is very near at hand when those who are concerned with industrial surveys will feel like enlarging the function and employing the use of more time of the industrial doctor.

I don't want to raise a discordant note. I did ask a question as to the percentage of those eyes found in the survey here, twenty-two per cent, as having pathology. I asked how much of that pathology was discovered through the ophthalmoscope; for, after all, any doctor can turn the lid or can inspect the external tissues of the eye and see whether there is any pathology there. There were three cases of optic atrophy. Your distance test on the Snellen card would bring it out. A real industrial plant physician would discover evidence enough to refer for expert care if he had made the survey.

The industrial physician is the man who is going to make the physical examination before the man is employed. He is the man to give the first aid. He is the man who ought to make the intitial eye examination. I believe that if the ophthalmologist comes into the plant as a consultant rather than as a surveyor we are going to get along very much better. I doubt whether we are ever going to get to the stage where we employ nose and throat specialists to examine the noses and throats; dentists to examine the teeth; and ophthalmologists to examine the eyes of those in industry. That is too near the millennium.

I do hope that the time will come when we are going to get a very much better job and a very much higher type of job, and an initial job that will reach all the organs of the special senses by an all-around plant physician who, in turn, can pass on to someone else in the plant a lot of this infernal detail which is making his life a cross between a life insurance man and a clerk.

CHAIRMAN McBRIDE: Folks, the meeting is yours. It is open for further discussion.

DR. SYDNEY WALKER, JR.: I should like to say a word in regard to Dr. Hardy's excellent paper. First, I did not know that the contract optician, the survey optician had gotten this far South, or possibly that he had gotten as far North as we are. We have had a battle in Chicago and vicinity for several years, and especially there is one firm which has used the proposition of free examination and glasses at cost as bait to get the work of different large corporations.

The only way we have combated this evil has been through the plant physician. It is hard to make a business man or an executive, some of them especially, see that medical attention of this sort is of no value whatsoever. The only way in which we have really combated it has been through personal contact with the plant physician, and he is more or less staking his job on his refusal to allow opticians to make their customary surveys.

Relative to Dr. Hardy's paper, I will state that about two years ago my assistant and myself made a survey somewhat like the one brought out by Dr. Hardy. We took 200 men from a plant, so-called mine run, as they come. The firm was the Ingalls-Shephard Company of Harvey, makers of automobile crankshafts. They have a foundry with tremendous hammer machines that will deliver a blow of, I think, four or five tons. They have machine shops and all the paraphernalia which are so dangerous. As time was limited and it was only as an experiment, we took 200 so-called mine run cases.

Our figures, as I remember them, were about the same as Dr. Hardy's, about 20 per cent among the eyes divided in the same category as he has shown you, but we also, in that experiment, made a cursory examination, as it took only a few moments, of the ears, nose and throat, the reason being that we felt the nose and throat had considerable bearing upon eye conditions. And since it was a hammer mill shop we also wanted to see what effect not only the nose and throat had on the ears but also the hammer.

Our figures, as I remember them, were rather surprising in that we found twice as many ear, nose and throat conditions as we did eye conditions, and among the ear conditions which we can throw out as not being related to the eye, only taking the nose and throat, we found approximately an equal number of nose and throat conditions which might sometime (I refer to sinus conditions and diseases of that kind) affect the eyes of the individuals.

So I feel that any survey made in any plant should be made along the lines, especially, of the eye, nose and throat for the reason that it only takes a very few moments to make a cursory examination of the latter three. That is something every oculist in practice has had, and even if he does not practice it now he has had a considerable amount of ear, nose and throat training.

Relative to the part of the paper in regard to preventive measures and eyes gained, I want to cite one or more less famous cases of ours. During the erection of the Palmer House in Chicago, a building in the neighborhood of from sixteen to twenty stories high, of steel construction, we had one incident of which I shall tell you. The work was done by the Starrett Company, and at that time they carried their own insurance. A case was sent to our office of one of the structural steel workers who had a slight burn from a hot flake of steel. When he came into the office the ordinary history was taken, and after that the regulation examination was gone through consisting of vision of each eye. Lo and behold, this man who was a structural steel worker and who walked the beams on the sixteenth floor without any trouble had 5/200 vision. In other words, for you who do not understand, this man could see at approximately five feet what he should have seen at 200 feet. He had a myopia of a quite high degree. His foreman was called. The man was taken off the structural steel work and put on a ground job. The insurance company, the man, and his family were all benefited. That was an instance in the city of Chicago.

We have had in our state no end of trouble relative to the examination of men before employment. I made some rather disparaging remarks relative to the routine and procedures of our Industrial Commission. I will say that up until a year ago the Industrial Commission of our state was controlled by the miners' union. The miners' union was very strong as evidenced by our show in Herrin about five years ago. Any man who wanted employment, or got it, did not have to submit to examination. He carried a union card and that was transportation anywhere. So that we have had a good deal of difficulty relative to the preliminary examination, or the examination of eyes before employment, the hindrance being principally on the side of the labor unions. I might dilate on this subject to some extent, but I think you understand well what I mean. If during the term of our present Governor we can have those changes made in our industrial laws, those changes made without antagonizing strong unions, we will go a great way toward saving considerable eyesight in the next four years.

CHAIRMAN McBRIDE: With regard to the surveys for detecting subnormal vision, may I just say this word from the employer's standpoint or from the industrial standpoint?

The thing closest to the heart of the worker is the security of employment, and the success of any movement of the sort we are considering must recognize that problem before it can be successful. That isn't quite true in entrance examinations, but it is admittedly recognized that in an entrance examination the burden is on the examining doctor to find the trouble because he will have no help from the man.

Doctor, it occurred to me while you were talking that perhaps we might take a page from the practice of one very successful national organization, the Tuberculosis Society. They have made progress in the past ten or fifteen years. I happen to know that, at least in St. Louis, there comes monthly to every medical director or advisor a letter stressing some particular phase of early diagnosis or sanatorium treatment, with the result that the matter of tuberculosis is constantly presented in some interesting way. I think the plant surgeon, plant physician, medical advisor, or whatever he may be, might be reached on the matter of eyesight and vision just as well as he can with tuberculosis.

Is there any further discussion?

DR. W. F. HARDY: I feel that some reply ought to be made to Dr. Royer's remarks. He evidently possesses a greater optimism than I, because he assumes that the shop doctor can evaluate what he sees in looking at the eye. If he can, he is better than the students and the graduates with whom I come in contact. They look and see but they can't interpret. If one can learn to look and see and interpret the external, one can with equal facility look and see and interpret the internal conditions of the eye. In other words, they can learn to use an ophthalmoscope. The fact of the matter is, industrial physicians do not and they cannot interpret what they see externally because of lack of training. They can't be sure because a great many cases are difficult even for an experienced ophthalmologist to diagnose.

While it might be well from an economical point of view to have the shop doctor examine the eyes (if the shop doctor exists,—which he does not in small industries) he should be able to use the ophthalmoscope. In fact I had incorporated a plan in my paper, which I later eliminated, whereby a practicing physician, not an ophthalmologist, might do all of these things but it would necessitate some acquaintance with ophthalmic pathology. I think that if ophthalmic conditions are to be diagnosed they should be diagnosed by someone who is familiar with ophthalmic conditions.

Mr. Arthur P. Thursby: Having listened to these several papers, and their discussions, particularly the remarks of Dr. Royer, I beg the opportunity for just a few words. It has been my privilege as an optician to be connected with the clinic conducted by the Department of Ophthalmology of Washington University, and to have served in that capacity for the past year and a half. During that period of close contact and observation I have learned, more than ever before, to appreciate and value the ophthalmologist and his work: First, with his knowledge of medicine, he cares for the maimed eye whether it be so through disease or injury; and second, with his knowledge of refraction, he makes the recovered eye see, and you and me probably otherwise normal, 100 per cent efficient in the tasks we have chosen as our life work.

Now, in my clinical observation I have found that no refraction should be considered complete and glasses prescribed without a thorough and complete physical examination of the eye. Therefore, it is my opinion, these two branches of ophthalmology, medicine and refraction, cannot be divorced, in justice to the person under examination.

Our observation of the Buck Stove and Range Company should rightfully be considered as a conservation procedure.

I deeply appreciate the opportunity of a place on your program, first, in being able to render you a service in assisting with this report; and second, in having a part in establishing a closer relationship between your organization, the ophthalmologist, and the Guild of Prescription Opticians of America, of which I am a member. We have a close and inseparable common interest, and the report which Dr. Hardy has so ably made proves that in such co-operation results may be accomplished that otherwise might be difficult to attain.

Our committee composed of representatives of the Ophthalmic Section of the St. Louis Medical Society, the St. Louis Ophthalmic

Society, and Members of the local Guild of Prescription Opticians, was organized for the purpose of inquiring into, and determining the value of an ophthalmic service to the industrial world, and how such a service could be best rendered.

We were fortunate indeed in having our first contact with this new field apparently ready and waiting for us. It was my privilege to have the first interview preparatory to our work in this plant and my only regret is that you could not have shared this pleasure with me. The manner in which I was received, the earnest expressions of appreciation as to the value of the service we proposed to render, will always be remembered by me, and with your permission I shall take this opportunity to say in appreciation of that reception that Mr. Jannuzzo, of whom I speak, and who was at that time Assistant General Manager of the Buck Stove and Range Company, has severed that connection to become a member of a newly organized Engineering Service Company having to do only with the stove manufacturing industry.

I may also say, Mr. Jannuzzo could be made a most valuable man to this organization in his new position. I have mentioned Mr. Jannuzzo in this way for this reason, he typifies that particular kind of an employer who maintains an open and appreciative mind to suggestions pertaining to the welfare of the employee. That such a man is appreciated by the employee was evidenced in the quiet, dignified manner in which the men and women of this plant submitted themselves to our investigations, which was true even to the higher members of their official family who awaited their turn in the examination room as did the others.

In making this contact I was fortunate in being able to present names of ophthalmologists who were to serve in this work, who immediately commanded the respect of my hearers, and from that time on our work progressed with but the normal interferences that would have to be met in any plant under observation.

It is, therefore, my firm belief that an ophthalmic service should be made available to industry, through an organization such as yours, and in co-operation with its kindred organization, the Guild of Prescription Opticians of America, who in turn typify the best thought in optical service as it should co-operate with the ophthalmologist.

A co-ordinated service such as this with your organization as a background would compel the attention of employers and make them conscious that such a service is the only service that could properly assume such a responsibility.

Summed up, since the eye physician's service would most certainly be sought when the saving of an eye was in question, why should not use be made of it in the preventive field of service, which should rightly be considered first in importance.

Inasmuch as this committee has other investigations under consideration, I beg to offer this suggestion, that the committee making this report, through Dr. Hardy, composed as it is of the highest types of ophthalmologists, together with members of the Guild of

Prescription Opticians of America, be made your committee and function as such during the coming year, during which time we may complete at least two more investigations, making possible a more extensive report to you. The experience gained, the time and thought devoted to it by this committee will prove invaluable to you in these future efforts.

Chairman McBride: Thank you, Mr. Thursby, for that contribution.

I wonder if it doesn't sum up pretty much this way: The ideal practice would be just such a survey as has been described, but when you can't get the whole loaf, take half of it. In other words, if you can't get a complete survey of the character described, then endeavor to educate the plant doctor or medical advisor to tie in with some recognized eye doctor to come in and help him do the work from his level on; in other words, putting them through a screen as it were.

It seems to me there are two conditions. One is the ideal, and perhaps the other is something to fall back on if the ideal cannot be reached.

Is there any further discussion of this afternoon's subject?

Mr. T. J. Healey: I would like to make a few remarks with regards to Mr. Carris' paper. It has been my pleasure through the accident prevention department of insurance companies for the past fifteen years to make safety inspections in industrial plants and in that time I have worked strenuously on the wearing of goggles and safety shoes. The question of guarding belts, pullies, moving parts of machines, set screws, etc., is practically well taken care of in most industrial plants.

The statistics shown in Mr. Carris' paper are wonderful but we will never be able to get any place with it until we get it to the executive. Some one stated here that the foreman can put it over. My experience is, taken from an average of between seven and eight hundred industrial plant visits throughout the year, that you can't put it over with the foreman. He will "yes" you to death. It positively must come through the management.

I believe it will be permissible to mention names here. We have in St. Louis one plant, the Pullman works, where every man is furnished with goggles, from the office force down. Goggles are furnished them at the time of hiring and, when in the plant, they positively must wear them. This is put over by discipline backed up by the management. Goggles are furnished by the company and prescription lenses where necessary are also furnished by the company. I positively know that in plants where the man has come directly from the Pullman works and gone into another plant where the wearing of goggles was not compulsory, he didn't wear them. He had a wonderful opportunity to sell this item of safety to that plant but he didn't do it. It was the management that put it over; it hasn't been because the individual wanted to do it. It is compulsory.

I have the honor of being the president of the Safety Engineers

Club in St. Louis; also a member of the Executive Committee of the St. Louis Safety Council, an organization which is bending every effort to prevent accidents in the plants, on the street and in the homes. In our Safety Engineers Club, we have a membership of around 65, all active in the prevention of accidents. This membership is composed of insurance supervisors and inspectors and safety men from self-insurers, comprising the largest risks in St. Louis. We meet once a month for an interchange of safety thought and safety ideas. We discuss all phases of safety and every member of the organization is striving to promote ways of reducing this industrial waste. I am sure they would appreciate a copy of the statistics as outlined in Mr. Carris' paper to lay on the manager's table and say, "Here is what can be done, but you, Mr. Manager, are the only one who can put it over."

Dr. Hardy's proposition is wonderful if it can be sold to the management. However, I am sorry to say that sometimes they count the cost and say, "How much of my men's time is it going to take?" If the employers could be sold on this proposition, we could make it compulsory for every man who is hired to pass an optical examination just the same as they submit to the medical examination which is being carried out in a number of our industrial plants. I know of several plants where dental surveys were made, and this is simply another step in industrial welfare.

I believe if this paper is broadcast as Mr. Carris says, something will come from it, and I would most certainly like to have a copy of that paper to discuss in the various plants I visit; also to discuss at one of our Safety Engineers Club meetings.

CHAIRMAN McBRIDE: I feel that we can endorse what Mr. Healey says, that you have to sell management first before you can make much progress.

ARMISTICE DAY BANQUET

COMMANDER C. D. PICKRELL, M.D., Chairman
COLONEL H. D. MCBRIDE, Toastmaster

Since this banquet was given under the auspices of the Lloyd R. Boutwell Post No. 136, American Legion, no transcription was made of the meeting.

Speakers for the evening were Reverend Harold L. Reader, W. C. Gibson, M.D., Medical Officer in Charge, United States Veterans Hospital, Jefferson Barracks, Missouri, and Lewis H. Carris.

Social Hygiene in Relation to Prevention of Blindness

Reverend Alphonse M. Schwitalla, S. J., *Chairman*

SOCIAL HYGIENE IN RELATION TO PREVENTION OF BLINDNESS

THE REVEREND ALPHONSE M. SCHWITALLA, S. J., Chairman

CHAIRMAN SCHWITALLA: This session, as you know and as you have seen from the program, is under the joint auspices of the National Society for the Prevention of Blindness and also of the Missouri Social Hygiene Association. I believe it is a matter upon which the Society for the Prevention of Blindness should be complimented that with the foresight that is not characteristic of many other organizations they found it advisable and desirable to meet with this other association because the fields that overlap, as you all know, are so very large in the interests of both organizations that a joint conference of this kind is more than desirable and should result in a great deal of mutual understanding of common problems.

Osler has remarked that there are two kinds of medicine, syphilitic medicine and non-syphilitic medicine, and if he wanted to practice with the idea of earning a great deal of money and have a great many patients he would not be practicing non-syphilitic medicine. Thus the problems before us today are some of the biggest in medical practice.

As indicated by the program, the plan of the meeting will be the presentation of the three papers after which comments will be called for from the audience, and the official discussion of the papers will take place at the end of the meeting.

It gives me great pleasure, therefore, to call first upon Dr. Edward H. Cary.

Syphilis, Its Prevalence and Eye Ravages

EDWARD H. CARY, M.D., LL.D., F.A.C.S.
Professor of Ophthalmology and Oto-Laryngology, Baylor University, College of Medicine, Dallas, Tex.

No one can deny that war has had a profound influence, both for good and evil, with traceable results accepted as potent in the affairs of man. Great leaders have utilized manpower to make or mar great nations, suddenly changing the status of mankind, advancing or pushing back achieved civilization. However, it is obviously true that the skeins of history have been closely knit and more or less clandestinely interwoven with communicable diseases. They have been factors in decimating nations, sometimes being as spectacular as a great war or invasion. Among the less spectacular, but consistently destructive communicable diseases, is syphilis, which has been a constant influence throughout the ages, and is still playing no small part in undermining the health of the peoples.

Certain races have gained a greater tolerance, or I should say, resistance to syphilis, and suffer less from it, but it survives everywhere in spite of man's cellular activity or artificial methods of defense and so-called cures. The cellular structure of man is rarely rapidly submerged by this infection of *treponema pallida*. More often the reaction is one of cell proliferation to the point of defensive protection. Antigens have their antibodies, hence the clinician can observe the battle that is on between host and invader. This is true in part, for we all know that the laboratory test is frequently our only guide to the hidden struggle, which may exist in structures, the function of these in most part being not disturbed, therefore, neither the clinician nor the patient is any the wiser unless constantly on guard.

When one looks into the literature to find data as to the prevalence of syphilis among people of the present time, one is confronted with statistics so varied, that any essayist would be foolhardy to apply them to the population as a whole, unless at the outset it is made clear that it is, at best, an estimate based upon results of serological examinations in different institutions, such examinations having taken into consideration age, sex, nativity, occupation and social position.

Formerly, without any proof offered to substantiate an opinion, the prevalence of this disease was thought to be extravagantly widespread. It has been stated in the literature by various writers, that syphilis infects from 12 to 18 per cent of the population of such cities as Berlin, Paris and New York.

Hospital reports where Wassermanns have been made, have supported the clinical view very largely, that syphilis is to be always considered an underlying possibility. It has caused the clinician frequently to revise his opinion when the Wassermann was negative, or at least, to force him to a more exhaustive effort at a correct diagnosis, while as indicated above, the routine Wassermann has frequently brought to light syphilitic conditions where they were not anticipated.

Many thousands of tests at the Harvard Neuropathological Laboratory (Southward) found that 23 per cent of the patients gave positive reactions. Ten thousand cases studied at the Philadelphia General Hospital (Rosenberger), gave a positive Wassermann of 26.45 per cent. Although I shall try to avoid statistics, my subject requires at least a running comment. Williams at Johns Hopkins found an average of 11.2 per cent of the patients in the obstetric wards are positive; the white women were 2.48 per cent; among the black, 16.29 per cent. In the Toronto General Hospital, the average for ten years of 27,115 patients showed a positive Wassermann of 6.4 per cent.

Vedder's statistics on Army records are too long to quote, but they are extremely interesting, for they show positive Wassermann reactions of four plus and three plus in young cadets totaling 5.46 per cent; in recruits, 16.77 per cent; while enlisted developed 16.08 per cent and as expected, the colored were higher, showing 36 per cent. Of this number, known cases of syphilis only existed in a small percentage of the enlisted men. The recruits and cadets had been rigidly examined for entrance. In these cases, nothing suggested syphilis in the early examination, and only the Wassermann developed the facts.

Craig expressed the belief that if routine Wassermann tests were made upon freshmen entering the colleges, three per cent of such students would give positive reactions. The colored race has easily two or three times larger percentage of infection than the white race, so far as Wassermann reactions are concerned, but the percentage of recognized lesions is not greater than that in the white race.

In the army, tuberculosis is frequently associated with syphilis. Vedder's statistics showed that in the Army, tuberculous patients also had 39 per cent incidence of positive Wassermann, while in civil life 16 to 23 per cent is the estimate. Nickson and Leibly, over a period of seven years, had 17,132 consecutive Wassermann tests upon adults of the better class, divided into obstetrics, medical and surgical; this group developed 1.9 per cent as the general average, varying very little, from year to year.

How will we apply the information gained from many sources, to the population at large, and thereby reach a reasonably accurate conclusion as to the prevalence of syphilis among all the people?

Thirty years ago, when I served in Bellevue in New York, before we had any laboratory tests as an aid, I, as a young doctor, was led to believe that syphilis was almost universal among the people who came there for service. Osler's statement, that to understand disease, one would have to understand syphilis, was accepted as a truism.

Of course, we recognize now, that it was and is an easy clinical assumption. The refinements of diagnosis have justified further clinical efforts, determining other causes than syphilis in obscure cases. In my present practice, which is among white persons, both rural and urban, where the better class of country people come to the city for help, I soon found that the incidence of syphilis was much less than I supposed. Hence, any broad statement that a large percentage of the population of this country is affected, would seem to me to be an error.

Thomas Parran, Jr., outlines a census of syphilis cases under treatment of physicians, hospitals, clinics and other institutions at a given date. These studies were made among 12,000,000 persons, both rural and urban. The urban rate is five to one greater than the rural rate. The patients with syphilis under treatment, vary from 0.5 cases per thousand, to not more than 10 cases per thousand. In other words, known cases early and late, under treatment, represented about 0.4 per cent. Apply this ratio to the nation as a whole, and you would have his estimate of 511,256 known cases of syphilis currently treated. Of this number, about 200,000 would be supposedly not over one year old, representing new cases. When you consider that this number each year, is added to those that have gone before, to be lost sight of in another year or two, you can see how the Wassermanns done in hospitals, army camps and laboratories generally, show an increase in numbers. It is to be expected that old syphilitics representing those who would still give a positive Wassermann, would cease to be known by the profession or hospitals, and yet would constitute a large number of so-called latent syphilitics.

There are several ways of estimating the percentage of the whole population infected; one might apply known figures in two or three different ways. I feel it unwarranted to claim accuracy, but it would seem reasonable to suppose that from six to seven per cent of the total population, if all persons were examined, would show a positive Wassermann. This estimate would, of course, represent from 7,500,000 to 8,500,000 persons who could be identified as carriers of the *treponema pallida.*

As a social problem, syphilis has hidden beneath the petticoat of human embarrassment on the one hand, and the breeches of impetuosity on the other. Having the disease has not deterred the carriers from exposure. The uninfected would cry aloud to Heaven, if they knew about syphilis, its history and ravages; provided they thought it immediately concerned themselves. They do not discuss the subject, nor aid any intelligent effort to correct the conditions, for the subject is "taboo," just as the Victorian Era developed repression regarding all sex problems.

As long as there was no specific knowledge of cause and cure, one could not complain about repression, but with Schaudinn's discovery and Wassermann's contribution, with Ehrlich's aid to the doctors' armamentarium, we were then placed in a position intelligently to handle a great problem which had heretofore been surrounded with too many mysteries. The curtain should be lifted; our present knowledge and good sense should dispel the veil without offending the proprieties.

Some one has said that if we could remove from the minds of our people the impression that this disease is the result of sin, and attack the disease as one would attack any enemy to mankind, with all of the facts concerning it revealed, then there would be a different approach—a development of more effective methods of control—a more rapid elimination of the infective agent.

The right kind of publicity in which syphilis could be discussed, as one would typhoid, would seem desirable. It is true that it is embarrassing to have typhoid, if it comes from the milk supply or water supply of one's own back yard, but when it comes through the water supply or milk supply of a community, one bears the result with less embarrassment. Inherited syphilis, although distressing, is certainly not as embarrassing as acquired syphilis. The discussion of the importance of applying the knowledge we have, and the cure that can be had, certainly can be so handled that its discussion would not be as painful, as it now is.

Insurance companies find that about one-fourth of one per cent of their applicants admit having had syphilis. These companies have different rates for these cases, based upon certain facts that can be developed from the case; and of course, in some instances, syphilitics are refused altogether. The longevity of the known syphilitic is definitely understood to represent an expectancy which is much less than the non-syphilitic, and they are penalized accordingly.

It would seem that the insurance companies with their vast machinery for educating the applicant to this important decision of higher rates, due to higher mortality because of syphilis, could be utilized as one of the means of developing sympathy with a larger application of better methods of prevention, and of control, where it occurs.

It is not in the scope of my paper, to discuss the many manifestations of syphilis, other than its ravages to the eye, but it is difficult for me when I see a syphilitic eye, to think of the eye alone. I realize that the eye is an incident in the vast organism of man, and it is incidentally infected with the whole. In the eye, we see this disease, in its primary, secondary and tertiary stages. It is true we do not see it in its primary stage very often, but when once seen, where it involves the conjunctiva and lid of the eye, the impression created will never be forgotten.

Syphilitic iritis does not belong to the primary state of syphilis. Usually roseola in the eye causes no trouble. It soon passes away, and is supposed to be due to the capillary emboli of the *treponema pallida*. The overwhelming majority of cases of syphilitic eyes occur during the secondary stage.

Papular iritis is sometimes called iritis gummosa. Papules involve the deeper tissues of the iris. When a papule is absorbed, there is a loss of pigment sustained by the anterior layer of the iris with characteristic posterior synechiæ left in the region of the sphincter iris.

Uveitis is, in many instances, the result of syphilis. It is certainly true that other infections occurring in syphilitic patients, make uveitis more certain. I am constrained to believe that the ophthalmologist has a very interesting and perplexing problem when confronted with uveitis, one which brings into play, all of his clinical knowledge—uveitis being the expression of something wrong with the eye, the cause is understandable, if one is not misled with a preconceived assumption.

Lesions involving the choroid and retina are more or less characteristic and are usually classified by the well trained ophthalmologist. These lesions constitute a fair percentage of intra-ocular eye troubles which aid in the diagnosis of syphilis. Neuro-retinitis is also observed in syphilis. I have seen it in its acute form associated with brain lesions, where epileptiform seizures were part of the syndrome. We frequently see it as a late stage of syphilis where progressive atrophy is a part of the syphilitic process. The prognosis has always been bad, and it suggests that an ounce of prevention is worth a ton of cure.

Then, too, gumma in and around the orbit are always to be considered. Tumors of every kind, have to be kept in mind. Differential diagnosis is important.

Congenital syphilis involving the choroid and retina is often so characteristic that ophthalmoscopically, its genesis is recognized at once, there being a diffuse atrophy or pigment epithelium alternating with spots of pigment and white patches. All such observations have to be sustained with careful systemic analysis. Infectious diseases of all kinds may involve the choroid. Where optic neuritis is the result of syphilis, both congenital and acquired, we must not lose sight of other infectious diseases as a probable cause, for sinuses are frequently at fault. Tumors of the brain, particularly involving the hypophysis must be taken into consideration for optic atrophy is often the result.

Congenital syphilis can be recognized in many forms, and there is usually a positive Wassermann reaction. This may be negative however, until provoked allergically.

Henri Gougerat attempts to accomplish three things: 1, To be able to precisely define the prognosis of syphilis; 2, to render the prognosis more favorable; and 3, to cure rebellious cases.

He discusses the interesting observations of Dujardin and De Camps of Belgium, who use allergy to aid in solving the heretofore mystifying problems of prognosis, with a corresponding guide to treatments. A sterile, non-specific horse serum known as hemastyl or sterilized cow's milk, is used intradermally, as an agent to determine skin reactions, enabling the physician to determine good cases and bad cases for treatment; also to convert bad cases into good cases. The intradermal reaction makes it possible to observe the allergic fluctuations and measure their intensity, for all practical purposes. Syphilis is classified by these reactions, into allergic and anallergic cases. The former respond to treatment while the latter do not, unless the individual can be made allergic. It is an interesting bit of work, and with increasing observation along this line, it seems quite possible to develop a more accurate prognostic view.

The negative Wassermann should not be the end of one's search for this suspected condition for the individual may be anallergic. Not only are eye lesions present in congenital syphilis, which are more or less characteristic, but there are certain eye weaknesses, muscular imbalances, neurological abnormalities, as well as certain dystrophias—all of which fall under the ravages of syphilis as it affects the eye.

The percentages of these different eye diseases classified under different names, all syphilitic in origin, have been worked out in certain places, as by Lamb in Missouri, and I think, are in the main applicable to syphilitics of other sections of the country.

Smith claims or suggests a striking analogy of synovitis of the knees and interstitial keratitis, due to the fact that both frequently occur bilaterally. He says they seem foreordained—certain cases will be unilateral and others bilateral, and the latter simply run their normal course, when they develop at different dates. Then he raises the question, "Can interstitial keratitis be prevented by thorough early treatment?" He answers it by saying "Carvill and Derby cite clinical histories to show that treatment of late congenital syphilis does not prevent the occurrence of interstitial keratitis." All of which is interesting, particularly when we are told in the same article that 100 cases received arsphenamine early when only one eye was involved, and 19 per cent have not had an attack within a period of 15 months to a period of more than seven years. Evidently, treatment is effective and the patient is not foreordained to have a bilateral keratitis.

Now my conception of this differs. Eighty per cent or more of interstitial keratitis occurs in congenital syphilis. The *treponema pallida* have been found in the interstices of the cornea and apparently precipitate the corneal reaction. The lack of vascularity of the cornea makes it a very chronic symptom of syphilis. The result of treatment is slow, and when one eye is apparently well, or much better, it is true that the other eye usually becomes involved. The presence of the cause of the corneal reaction is tolerated in this nonvascular structure, and may remain undisturbed, while the other cornea, with an increased blood supply due to more rapid reaction of cause and effect, is corrected because of the ability of the new blood supply to carry the remedies within the cornea, it being understood that new blood vessels grow into the cornea as interstitial keratitis develops.

Treatment should be vigorously carried forward as heretofore—in addition, since Shahan has shown that the cornea will stand 116° F. for ten minutes without harm. I raise the question here, of local heat. Not only the reacting eye with keratitis, but the eye not yet known to be infected, should be so treated with heat repeatedly, never high enough to harm the epithelium, but to cause the cornea to be heated to at least 106° F. which is quite sufficient to destroy the *treponema pallida.*

Schamberg and Rule[1] have shown that rabbits have been used to demonstrate certain therapeutic effects of fever in experimental rabbit syphilis, which confirms all of the clinical observation of malarial infection in the treatment of neurosyphilis. I raise the question of the value of applied local heat as well as the definite value of heat of any kind, repeatedly brought about to either destroy the *treponema pallida* or render them less virulent when medicines would become more efficaceous.

When we recognize the apparent ease with which the pregnant woman can be treated, and the syphilitic fetus can be made free from congenital infection, then it is a crime in this day and time, when more and more children are being born in hospitals, to have any syphilitic woman delivered of the full time baby without first having had sufficient treatment to give the child his chance.

Syphilis offers the finest opportunity for group practice of any of the diseases, and the patient is fortunate who falls into the hands of the physician who can intelligently handle his case and can impress the patient with the importance of consultation with his confreres who are able to collaborate. The patient is indeed fortunate, to have the responsibility placed upon the one best fitted to carry out treatment, follow up the case, and see to it that what we call a cure, is established.

BIBLIOGRAPHY

SOUTHWARD: Statistical Notes on a series of 6,000 Wassermann Tests for Syphilis performed in the Harvard Neuropathological Laboratory, 1913, Boston. M. & S. J. 170: 947, 1914.

ROSENBERGER: Summary of the Wassermann Tests done during 1916 in the Philadelphia General Hospital, New York Medical Journal. 105: 1233, 1917.

WILLIAMS, J. W: Wassermann Reactions in Obstetrics, Bull. Johns Hopkins Hospital 31: 335, 1920.

KEIDEL, A., and MOORE, J. A.: Wassermann Reactions, in Johns Hopkins Hosp. Bull. 34: 16, 1923.

VEDDER: U. S. War Dept. S. G. O. Bull. no. 8, p. 60.

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[1] Archives of Dermatology and Syphilology, Sept., 1926, page 243.

CRAIG: The Wassermann Tests, St. Louis, C. V. Mosby Company, 1918, p. 167.

NICKSON, D. H., and LEIBLY, FRANK J.: The Wassermann Reactions as a routine test in Hospital practice, Archives of Dermatology and Syphilology, May, 1929, p. 737.

PARRAN, THOS., JR.: Statistical and Public Health Research in Syphilis, Venereal Disease Information, December 20, 1928, p. 535. (United States Public Health Service.)

GOUGERAT, HENRI: The Prognostic and Therapeutic Value of Intradermal Injections of Non-specific Proteins in Syphilis. The American Journal of Syphilis, October, 1928, p. 487.

SMITH, C. MORTON: One Thousand Cases of Congenital Syphilis, Archives of Dermatology and Syphilology, May, 1927, Vol. 15, p. 527–545.

CHAIRMAN SCHWITALLA: Dr. Cary, you have certainly opened up a statistician's paradise for us and there ought to be some room for discussion if your figures vary from six to 62 per cent. My colored janitor watches my fish ponds for me with great care, and I explained to him he was my episcoporial statistician. He felt very proud of that title. A little later, I said, "Jim, what do you think of statistics now?"

He said, "They are very useful; otherwise, you couldn't find out how many fish died."

So we are going to hear a little more about the prevalence of syphilis by our next speaker, Dr. O'Brien.

Adequate Treatment of Syphilis to Avert Eye Disaster

C. S. O'Brien, M.D.

Professor and Head of Department of Ophthalmology, State University of Iowa, Iowa City, Iowa

Syphilis in its varied manifestations is one of the most frequent causes of loss of vision. We meet with its ravages in infants, children, adults, and in the aged. What is more distressing than the long period of inflammation and resulting diminution of vision which occurs in children who are affected with interstitial keratitis! Or again, a condition which is even more fearful—the blindness which so often accompanies such metasyphilitic diseases as tabes and paresis!

The adequate treatment of syphilis is a problem which concerns not only the individual but also the state. Our blind institutions contain large numbers of inmates who have become state charges through the ravages of hereditary or acquired syphilis.

"An ounce of prevention is worth a pound of cure"—this is an old adage which may be well applied to the problem of syphilis. Perhaps the disease will never be entirely eradicated but by persistent educational propaganda, along with the enactment and enforcement of suitable laws, it is to be hoped that we may reduce greatly the percentage of blindness.

Education of the masses in matters such as this is a long, tedious process, but such education is possible if a persistent effort is made by both medical and lay organizations. Great headway has been made toward the eradication of gonorrheal ophthalmia, consequently it is not too much to expect some similar sort of control in syphilis. It is to be hoped that some time in the future each and every member of society will be compelled to submit to a blood test at certain stated periods of life. In the event that this test shows syphilitic infection a long course of compulsory treatment should be carried out. All persons on the verge of marriage should have a blood test and if syphilis is found in either contracting party the marriage should be delayed until all traces of the disease have disappeared. The expectant mother should be educated to visit her physician as soon as she realizes she is to become a mother. If she submits herself for examination early in pregnancy and is found to be suffering from syphilis, it is possible by proper treatment to prevent infection in her child.

Inherited syphilis is a frequent cause of poor vision. A high percentage of untreated syphilitic children sooner or later fall victim to inflammation of the cornea. This disease, interstitial keratitis by name, causes scar formation in the transparent anterior segment of the eyeball with consequent diminution of vision. It occurs usually during a period of life in which the child is attending school and necessitates not only prolonged absence from school during the course of the inflammation but causes visual difficulties forever after. If syphilis is recognized in the child during infancy and the proper treatment is carried out, few cases of interstitial keratitis develop. If, on the other hand, the disease is not recognized until the outbreak of the corneal inflammation, very little can be done to stop the process. In many instances the disease breaks out in the second eye while the child is under an intensive course of treatment. Consequently it is readily understood that the only adequate treatment for such a condition lies in its prevention; i.e., in the recognition and proper treatment of syphilis in early infancy.

Inflammations and degenerations of the choroid, retina and optic nerve are frequently encountered in children with inherited syphilis. The vision is usually extremely poor or total blindness is present. As a rule the child is born with the eyes in this condition; i.e., the active process has occurred in utero. The only possible chance such a child has ever had for vision has been lost through failure to recognize and treat the disease in the mother. If the disease had been detected in the mother before marriage or even in the early stages of pregnancy and had been followed by proper treatment, it is probable that the child would have been born with normal eyes.

In order to prevent inherited syphilitic eye defects we must exert ourselves toward educational propaganda. The people must be made to realize the importance of being free from such a disease before marriage. Women must be educated to have their blood examined as soon as the knowledge of pregnancy exists. Last, but not least, it must be impressed upon those who suffer from syphilis that they are not cured when the external lesions disappear but that a prolonged course of treatment is necessary.

Acquired syphilis with its manifold ocular manifestations is indeed a grave problem. The eye may be affected in the primary, secondary or tertiary stage of the disease, but our greatest difficulty lies in the treatment of those lesions which accompany metasyphilis; i.e., tabes and general paresis.

As a rule the primary lesion of syphilis is rarely found in the region of the eye. Occasionally one sees a chancre of the lids but this has no effect on vision.

In the secondary stage an iritis may develop. Formerly these cases of iritis were rather frequent but now one sees them only occasionally. It is believed by some authorities that syphilis is undergoing a metamorphosis; i.e., whereas, formerly the skin and vascular system were affected to the greatest extent, now the nervous system bears the brunt of the infection in a high percentage of cases. In addition to iritis, lesions of the choroid, retina, and optic nerve also occur in the secondary stage. All these lesions are of the acute inflammatory type and respond readily to injections of arsenical preparations, mercury and bismuth. If syphilis attacked the eye only in the secondary stage and we, as oculists, had to deal with these lesions alone there would be few cases of blindness from this cause. However, the excellent response of the inflammation to treatment in this stage does not guarantee immunity from future lesions of the eye in the tertiary stage or in that of metasyphilis. Only the continuation of prolonged treatment insures the patient against future troubles.

Tertiary syphilis may affect the eye in various ways. Gumma formation may be found in the iris or ciliary body. Brain syphilis, occurring in the tertiary stage, may produce inflammation or degeneration of the optic nerve. Such a condition may lead to blindness. Usually this type of lesion appears within a few years after the initial infection. Treatment of such tertiary lesions should be carried out through the prolonged administration of iodides and mercury; later small doses of salvarsan are indicated. The course of treatment should be over a period of years. As a rule the response is good and no permanent loss of vision follows.

Optic atrophy, accompanying metasyphilis, is the most dreaded manifestation of the disease with which the oculist comes into contact. This type of atrophy is progressive and invariably leads to blindness. It occurs most frequently in men who are suffering from tabes or general paresis. Usually these patients are unaware of the fact that they have had a syphilitic infection for many years or they may have known it, taken a short course of treatment and then forgotten all about it. Such patients are often apparently in good health and pursue their customary routine in life until poor vision and blindness overtake them. They are thus rendered unfit to support and care for themselves and in many instances become public charges.

These patients usually pay their first visit to the oculist after vision is markedly diminished. There is no known method of treatment which will restore any of the lost visual function in these cases. Not only is it impossible to restore vision but in most instances it is likewise impossible to prevent further progression. These patients are doomed to blindness.

Many methods of treatment have been tried. In addition to the intravenous and intramuscular injections of arsenicals, mercury and bismuth preparations, there are among others the following: injections of salvarsanized serum into the spinal canal, injections of mercury into the cisterna of the cranial cavity, tryparsamide injections of malarial parasites into the blood stream, administration of strychnine, and negative galvanism to the eye. All are inadequate and, I firmly believe, without result in so far as the eye is concerned.

But there is an adequate method of treatment which will prevent such eye disasters. This lies in the early diagnosis of syphilis followed by the employment of strenuous methods of treatment over a prolonged period of time. There are a few individuals who contract syphilis and never know it until they reach the stage of metalues, but these are in the minority. The passage and enforcement of laws requiring everyone to have a blood test would take care of this class of case. But these are not the worse offenders—the greatest number of cases of optic atrophy occur in those persons who contract syphilis, take a short course of treatment and then for various insufficient reasons stop all medication. This failure to continue treatment occurs in spite of advice from the physician to the contrary. There is no doctor living who does not realize that this type of patient is a future candidate for the blind home and none who has not advised each and every syphilitic against undertreatment. It should be possible to force all those who are infected with syphilis to continue treatment until duly discharged by their attending physician. Prolonged treatment of early syphilis would prevent most of the blindness which occurs as a result of metasyphilitic disease.

The adequate treatment of syphilis to prevent eye disaster appears to lie in education of the public by medical and lay organizations whereby every individual may be made to realize that:

1. It is a menace to society.
2. It can be controlled by proper co-operation.

3. Laws should be passed and enforced whereby all members of society would submit to a blood test at stated intervals.

4. All persons contemplating marriage should be free from syphilis.

5. Women should consult a physician for a blood test as soon as they become aware of pregnancy.

6. If syphilis is contracted, immediate and prolonged treatment is necessary.

CHAIRMAN SCHWITALLA: Are there any questions from the house on Dr. O'Brien's paper? If not, I will call on Dr. Royer, Medical Director of the National Society for the Prevention of Blindness of New York City, to speak to us on "Ophthalmia Neonatorum."

Ophthalmia Neonatorum

B. FRANKLIN ROYER, M.D.

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When the eyes of a young baby become red and sore and discharge pus doctors speak of the condition as "ophthalmia neonatorum." If the eyes become sore within a week after birth occurs, the germ causing the inflammation in all probability came from the mother and gained entrance to the baby's eyes as it passed through the birth channel. When the eyes become sore a week after birth the chances are that the germs came from some environmental source by one of several routes. The eyes of babies are easily damaged by any kind of infection and much blindness occurs from such infection that may readily be prevented.

A hundred years ago Gibson, in Manchester, England, pointed out that proper treatment of expectant mothers, prompt removal of soilage from the eyes of the newborn and irrigation of the eyes of infants would avert the tragedy of blindness. About eighty years later Credé, in the Maternity Hospital of Leipsic, experimented with these procedures and in 1881 gave the world a preventive plan of treatment that has become almost universal in application.

Credé's hospital admitted women who were poor, many of them coming from a low social level, and in large numbers their babies developed inflammation of the eyes with loss of eyesight. Birth infections of the eyes in the Leipsic Maternity under this preventive treatment of Credé fell from nearly ten per cent to one-half of one per cent. Since that time Credé's treatment has spared thousands of babies from blindness and countless others from damaged vision.

For a long time public health and social workers and even physicians were altogether too much impressed with the idea that the eye tragedies of the newborn were all due to a social disease known as gonorrhea and involving, in many instances, moral turpitude.

About twenty-five years ago, a young ophthalmologist, Mark Stevenson, of Akron, Ohio, was wise enough to assemble for us bacteriological explanation of all of these eye infections of the newborn. Establishment of these facts enabled health authorities and social workers to proceed without offending public sentiment to teach that it would be wise to use a prophylactic in the eyes following all births. Dr. Stevenson pointed out that these birth infections were due to at least half a dozen different germs, which we have since learned to recognize by skilfully applied laboratory technique.

Persons with any knowledge at all of birth procedures will at once see that it is almost impossible for a baby to be born without having its eye tissues soiled with bowel contents, hence the colon bacillus.

Any one who knows the frequent occurrence of boils, pimples and various local irritations that are caused by the staphylococcus will readily see that it is in no way disgraceful for these germs to be transmitted to the birth canal and for eye infections from the staphylococcus to occur.

Those who appreciate that the septic conditions (childbed fever) following childbirth are usually due to the streptococcus and that this germ may have multiplied in the bruised tissues of the uterus or birth canal, having been carried there from a discharging ear, or some other focus of infection in some distant area of the body, or from the hands or implements of the examining attendant, will readily understand that streptococci may be found as the cause of inflammation in the newborn baby's eyes.

Pneumococci, so constantly present in throat and lungs, may be transferred readily by the expectant mother's hands to the vaginal tissues of the birth channel and thence gain access to the baby's eyes during birth. The *Micrococcus catarrhalis* sometimes found in babies' sore eyes may have been transferred to the birth canal by the same route. Both of these types of germs may readily be sprayed over the baby's eyes by careless coughing or sneezing. Any of these germs may become a serious menace to the baby's eyesight.

Briefly, it is now generally accepted that approximately 60 per cent of birth infections of the eyes occurring the first week after babies are born are due to the gonococcus, a germ associated with a common form of venereal disease affecting the tissues of the birth canal of the mother, and that 40 per cent are due to the other infections mentioned, any of which may affect any mother's baby and be disastrous to vision.

Such conclusive studies justify health authorities and birth attendants in urging that every newborn baby should have its eyes cleansed and protected from the possibility of any sort of birth infection. Such studies show the advisability of teaching every mother to insist upon having cleansing drops placed in the eyes of her baby. This is the small price of safety. A weak solution of silver nitrate is almost universally recommended for this cleansing procedure.

At the present time nearly all states and large cities supply to doctors and midwives, for the most part free of cost, silver nitrate solution in the strength of one per cent. It is usually distributed in wax ampuls convenient for use and in packages suitable for carrying in obstetric bag outfits. The outfit carries a printed circular giving instruction for use.

There is no excuse, then, in the vast majority of our American families for not cleaning up *immediately* after birth occurs any eye infection squeezed into the eye as the baby passed through the birth canal. Many state laws and public health regulations require such procedure.

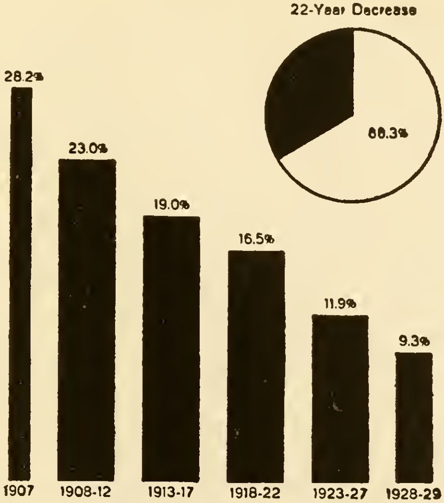
We have records from large maternity hospitals with statistics covering many thousands of births, including many births where the mothers came from a walk of life with great exposure to the more dangerous birth canal infection. Despite this dangerous factor, these hospitals assure us that no eye infections or blindness occurs, undoubtedly, they believe, because a prophylactic was used.

The procedure that is generally taught by all medical schools and urged by all health officials is as follows:

Immediately after the child is born the eyelids are cleansed with sterile absorbent cotton or gauze and sterile water. A separate pledget of cotton is used for each eye and the lids are washed from the nose outward until quite free from all blood, mucus, or meconium. The lids are not opened during this preliminary cleansing process. Next, the lids are separated by pulling the lower one down and two drops of a one per cent solution of silver nitrate are dropped into the little pouch formed when the lid is pulled down. (Dropping the solution on the eyeball in the vicinity of the pupil prompts quick closing of the eye and squeezing out of the drops.) The lids are then allowed to close slowly so that the silver nitrate solution may lie for a half-minute or longer in contact with every portion of the lining of the eyelids and the covering of the eyeball. In using silver nitrate solution provided in wax ampuls it is necessary that the ampul be punctured at the tip with a needle or pin. Pressure on the wax then squeezes through the little hole just a drop at a time of the solution. It is of some interest to note what has happened as a result of this sort of prophylactic procedure in this country. We have only a measure of results in certain instances.

Blindness is not a reportable affliction, hence health authorities have no exact statistics. We acquire certain of our information from the federal census office. That is incomplete and not accurate as to exact cause of the blindness. But from the great schools for training the blind throughout the United States we have been able to get a pretty accurate measure as to what caused the blindness of all pupils admitted. Ophthalmological attendants at these institutions have very carefully recorded the cause of the blindness.

Many years ago when we had only statistics from a few such schools, one-third of those admitted were blinded from infections acquired at birth. Coming a little more nearly up to date, statistics based on admissions to schools for training the blind in the greater geographical area of the United States, in 1908, showed more than 28 per cent had lost their vision from birth infections. The American Medical Association, ophthalmological groups throughout the country, public health workers and social workers have been urging throughout many years that a prophylactic be used. Statistics are gathered annually from these schools for the blind and are tabulated. Below is reproduced a chart showing what has occurred. This chart ignores the figures when we had but a few schools with rates about 30 per cent and starts the first column with 1908, when



Blindness Due to Ophthalmia Neonatorum in New Admissions to United States Schools for the Blind

28 per cent were blinded from birth infections; the subsequent years are arranged in five-year groupings. The rapid decline down to the last year for which statistics are available is well shown and illustrates as conclusively as anything can that the decline has been from 28 per cent to about 9 per cent. Blindness from that sort of birth infection under universal prophylaxis, in so far as it may be said to be universal because it is not yet universal, has already shown that striking drop which can scarcely be explained in any other way than as a result of this prophylactic procedure.

Discussion

CHAIRMAN SCHWITALLA: This remarkable series of papers, outstanding for its unified character and its presentation of a very important field of medicine, is now open for discussion. In the course of their remarks and their papers, the three speakers have touched upon every one of the larger fields of interest in social hygiene. They have touched upon the educative field or the educative function, the medical function prominently of course; the legal function also has been touched upon, and the recreational or prophylactic phase of social hygiene has been skirted in a number of remarks. Therefore, we are particularly anxious to hear from the social hygiene group regarding their reactions on the papers that have been presented and such thoughts as may have occurred to them in the course of the reading. Dr. Engman, Professor of Dermatology of the Washington University, and actively associated with social hygiene, is the first person to discuss these papers.

DR. MARTIN F. ENGMAN, Professor of Clinical Dermatology, Washington University, St. Louis, Mo.: When I was asked to discuss these papers, I accepted in fear and trembling for I had my doubts that I could fit in here as I thought the papers would be highly technical; but I am glad that they are not technical and have gone generally over the subject.

The papers are filled with information for all of us. They are filled with thoughts and ideas. They have given us a synopsis of syphilis particularly and have pointed out to us the importance of this disease. We know, for instance, that syphilis is a prevalent disease. We don't know the per cent in a given community, but it has been said that "syphilization follows civilization," which is no doubt true. The greater the population the higher is the percentage of syphilis. Today, with our rapid transit, such percentages have been rapidly changing.

If we were to go back to the late 15th or early 16th century and walked along the streets of any great city, say, London, we would see people pitted and terribly marked from smallpox; we would see missing noses, great protuberances and ulcerations on the face from syphilis; we would see any number of people going along with sticks, or being led, who were blind from gonorrhea.

The whole appearance or the phases of civilization have been changed by brains, by observation, by getting away from superstition and by studying disease, after the manner of Hippocrates. Out of thought has come these societies such as the one meeting here, the National Society for the Prevention of Blindness, and the American Social Hygiene Association which is so closely connected with it. I think we all owe a great debt of gratitude to organizations like these who are bending their energies in extending the knowledge that we have of these diseases.

There are many points of interest in these papers. For instance, Dr. Cary pointed out the fact that is well known that these diseases are the result of natural processes. Some years ago I had some rabbits with a strain of *spirochæta pallida* on which I was interested in continuing experiments. I was out of money. I went to a very wealthy man, a multimillionaire who was interested in medicine and who was interested in charitable things, and I thought I would ask him for some money. I took my son along. He was a young boy. I was afraid of the reaction this man would take. He gave me an appointment and I told him what I had. I said, "Mr. Jones, I have these rabbits and I believe I have a very mild strain of *spirochæta pallida* in these rabbits, so much so that they have no symptoms, but still they are *spirochæta pallida.* I believe through studies with apes and monkeys it may be possible to develop a vaccine against syphilis, similar to the vaccine they have for smallpox."

He said, "Doctor, if anyone would come to me and say, 'If you will give $1,000 we will wipe syphilis and gonorrhea off the face of the earth' (this was only about eighteen years ago) I wouldn't give that $1,000 because syphilis and gonorrhea were put on earth to make us moral, to frighten us."

Syphilis and gonorrhea are due to natural laws and microparasites that may be conquered by the endeavor and the work of man. Here is what occurs. The *spirochæta* enter the body from an external source. It may be from promiscuity. It may be accidentally from the drinking glass, or from a kiss—but it enters the body. Dr. Eberson, working in my laboratory, found that when *spirochæta* were injected into rabbits the *spirochæta* can be recovered in the lymph nodes in seventy-two hours. Brown and Pearce found them in forty-eight hours. We know there is not very much difference in the biological functions between man and rabbits. The *spirochæta* enter and are disseminated all over the body within a few days after the accidental contraction. These organisms go to every portion of the body. In some places they grow well and thrive; in other places they have not a very good medium in which to grow and they die off.

That is why we have these terrible accidents from late syphilis. The early cases of syphilis are more easily treated, but the late cases of syphilis are the ones Dr. O'Brien spoke of. In optic atrophy the *spirochæta* get in the nervous system in the early days of the disease. What happens? They become accustomed to the habitat. Nature provides certain little protective devices which are not sufficient to kill them, and they stay there for years. Finally, as time goes on, through some accident or some natural processes they begin pathogenic action, they begin their deleterious action and we have optic atrophy, paresis, and all these terrible diseases these gentlemen have told you about. Therefore, the fact is that the best time to be sure of treatment in syphilis is when it first invades the body. Everyone can remember that for the simple reason that then the organism, the body, is opposed to the invasion of the *spirochæta.* They are not accustomed to the hosts' defensive apparatus and are more easily killed off. Therefore, as pointed out by these gentlemen, in the early intensive treatment rests a cure.

I haven't had much experience with treatment of syphilis of the eye. I have been studying syphilis for thirty years in a pretty large clinic in both a laboratory and clinical way, and I have come to the conclusion in the last fifteen years that every man who goes out of a medical school should know syphilis more than he should know anything else. He should have an idea of syphilis, no matter whether the syphilis is of the heart, of the eye, of the liver or of the skin. The treatment is fundamentally the same, but every case is different and must be studied because any given individual is just as different chemically from another individual as he is in his physical features. We can all tell Tom, Dick and Harry, but chemically they are just as different as Tom, Dick and Harry. Therefore, syphilis must be treated with all the intelligence a physician possesses, and all the knowledge that he possesses. If it is in the aorta, then syphilis must be treated by a man who understands the heart and syphilis; if it is in the eye, a man who understands the eye and syphilis. I do not believe in a specialist in syphilis. In the future, undoubtedly all graduates of medicine will be more or less specialists of and have a profound knowledge of syphilis. That has not come in our medical schools because they just have not arisen to that fact. They realize that syphilis is a terrible disease in that it destroys lives and is of great social importance, but they just have not come to the point of putting syphilis on the basis that they have other diseases. It is really a branch of medicine in its whole relationship.

There is one thing I should like to point out just in this regard. We know we have strains. We have certain bacteria that grow better in one tissue than they do in another tissue. We know that. We have a great many organisms that grow better in the nervous system, like rabies, sleeping sickness; or other organisms which grow better in certain other tissues, such as the skin tissues; or those which grow in the heart, such as streptococcus viridans.

That, I am sure, must be applied to syphilis. A great many of our results in eye syphilis, the involvement of the eye and the optic nerve, the syphilis that the doctors pointed out, tabes and paresis, come from a special strain, a strain of *spirochæta* that have an affinity for the nervous system; they grow better in the nervous system. They do not grow so well in other parts of the body. I have thought that for a great many, many years from clinical observation. I have never been able to get the exact scientific data of this but it matches experiences of other men.

The main thing in knowing syphilis is in recognizing latent syphilis. The body is invaded with *spirochæta pallida*. Eruptions occur, and even if the patient had no treatment the body would conquer it more or less and the eruptions would disappear without treatment. Even the symptoms of the meninges covering the brain would disappear. If one took a Wassermann test there would be a four plus reaction. The body has done something. It has repressed the growth of these organisms, killed a lot of them but not killed them all. They retrench themselves, or they hide in some organ of the body, deep in the brain, around the optic tract or in the heart muscles, and they stay there for years. When the man attains his fortieth or fiftieth year—when he is of great importance to society—then the ravages of this thing may occur, either heart trouble, aneurysm, paresis, locomotor ataxia. Sometimes this may occur fifteen or twenty years after the first infection.

That is the dangerous point which Dr. O'Brien particularly brought out, this stage of latent syphilis. It is there. The organisms are ready to jump out and cause trouble. Dr. Eberson and I found active *spirochæta* in the semen of old syphilitics. We did not have to examine so many, but we found active *spirochæta* in three cases. That illustrates latency of syphilis. We were able to infect a rabbit from the *spirochæta* found in the semen, even after the man had had syphilis for many years.

Syphilis is the most treacherous disease we have. It masks itself under the guise of any other disease, sometimes typhoid, grippe, cancer, any disease of the body and puts on the clothes of that disease. It is most subtle, most treacherous, and yet it is good natured. It answers to treatment better and quicker, as far as symptoms are concerned, than any other disease. In that we have great hopes for the eradication of syphilis. But we cannot depend on treatment alone. Every individual is a law unto himself and the treatment of syphilis must be used with intelligence by individual physicians for individual patients.

It has given me great pleasure to speak here today and I want to close by saying that I am a great believer in such organizations as yours which aim toward prevention of disease. That is the thing we are after, prevention of disease. Through preventive medium comes relief to humanity.

CHAIRMAN SCHWITALLA: I wish now to call on Mr. Peter Kasius, Executive Secretary of the Missouri Social Hygiene Association.

MR. PETER KASIUS, Executive Secretary, Missouri Social Hygiene Association, St. Louis, Mo.: The few comments I shall make this morning will have no direct bearing on the technical papers, which I as a layman would not presume to discuss, but I beg your indulgence while I make one or two general observations on health education.

Those of us who are engaged in the field of health education, no matter what our particular specialty may be, are often baffled at what seems to us as sheer indifference on the part of human beings to their own self-preservation. I question very much whether there is such a condition as real indifference to physical well-being. We know, of course, that people are often willing to sacrifice personal health for ends which to them may not even be very clear. In fact, someone has said that every fine impulse is really "an excursion toward death." But on the whole, human beings will react favorably to health ideals if the methods of approach are educationally sound.

Now when we examine this apparent indifference to self-interest, we find that some of it is simply a matter of ignorance. In spite of the woeful ignorance which still persists among the masses of the population regarding the most elementary principles of health conservation, this aspect of the problem, I am optimistic enough to believe, is the simplest. Ignorance can be dissipated by a process of iteration and reiteration of sound information, but we should not delude ourselves into thinking that the dissemination of information of itself leads to better health habits and practices. Making information readily accessible is highly essential, but it is only the first step in an effective health program.

Coupled with the job of making sound information available is the more difficult task of building up a sense of discrimination between what is genuine and what is spurious. In this day of organized propaganda, all sorts of bizarre ideas are given currency in ways that are indistinguishable from the methods employed by dependable agencies. Those who have no use for the methods of science are never loath to employ the language of science in order to achieve their ends. An individual is not educated in a health sense until he is in a position to understand that only such knowledge which flows out of the scientific method is a valid and dependable guide to behavior. If, as health workers, we overlook this important factor we are likely to defeat our own ends.

My third and last point is that health knowledge to be effective must reach people through relationships that have some vital connection with the business of living. Mass exposure to knowledge does not insure genuine assimilation. A vague hint of impending disaster may unduly arouse a morbid fear in the minds of some people, but it leaves unaffected the large majority of people. For example, men and women can be touched in their parental relationships while direct personal appeals may utterly fail. Without a careful regard for the setting or the medium through which a health message proceeds, we are simply wasting our ammunition. Motives are fairly specific, and to the extent that we can identify them with vital relationships already established we shall be more or less successful in our efforts.

CHAIRMAN SCHWITALLA: Dr. Engman said a few moments ago when he spoke to us that there were two persons in the audience to whom we felt we owed a tremendous debt of gratitude and appreciation for the effect which their work has had upon the betterment of our citizens. He mentioned Dr. Royer, and you have heard Dr. Royer speak. He mentioned Dr. Snow, and you are going to hear Dr. Snow right now.

Dr. W. F. Snow, General Director, American Social Hygiene Association, New York, N. Y.: Mr. Chairman and Members of the Conference: Our topic is the relation of social hygiene to the prevention of blindness, and I think our Chairman expressed very well our feelings when he said these three papers have related themselves or correlated themselves in a remarkable way considering that these three persons had not had any opportunity to compare notes and divide their field.

I want to comment, since I have this privilege, on two or three points in these papers. Dr. Cary very wisely said, in speaking of attitudes, that we ought to think of these diseases and their relations to blindness as we do of all other communicable diseases. In practical application we frequently forget this important advice. One hears often in medical societies that the scientist has not provided us with any methods of immunization against syphilis or gonococcus infections. Yet from the preventive medicine point of view, science has developed some very simple methods of preventing infection so far as the eye is concerned. The use of silver salts in preventing ophthalmia neonatorum illustrates this.

It has also been said that if we can treat the pregnant mother early enough and effectively, we will save the eyes of her baby. These are immunizing procedures but they are prophylactic measures of the greatest importance not only for the preservation of eyesight but of other functions of the body.

From Dr. Engman's remarks we ought to realize that the ophthalmologist is a most important team worker with the general practitioner, not only in preventing these infections, but in diagnosing infections and arranging for treatment in later years. I do not mean that the ophthalmologist should not be a syphilologist as well as an ophthalmologist if he so chooses. I merely wish to emphasize what was said in a different way by Dr. Engman and Dr. Cary: that syphilis is a general disease, and if we could only get the medical profession and particularly the lay population to understand that whenever we find syphilis we must look at the patient and everything pertaining to his life as we do when we find tuberculosis, we could accomplish more in combating its ravages in the eye's structures as well as in other parts of the body. If a physician finds tuberculosis, he often says at once, "You must give up your occupation and home and live under other conditions. You must fight this disease to a finish even if it requires years. If you do so, you will win out." If the tuberculous patient is pregnant the doctor says, "Your problem is more difficult because of pregnancy and we must give this fact particular attention."

When it comes to the question of syphilis usually we do not follow the same procedure; we fail to give syphilis the center of the stage.

If the eye is infected by syphilis, we do not always consider the case one of generalized disease. I think for the patient's benefit we should say, "You have syphilis; your condition is complicated by serious eye conditions. You must make a business of being treated for syphilis, and we will do the best we can to save your eye sight as a part of your treatment." As Dr. Cary has said, group medicine or group practice is the key to this vital matter. If the ophthalmologist discovers the evidence of syphilis first, he should consider that his patient is a general group practice problem.

There is now in the process of organization by the Boston Dispensary and Tufts Medical School, a social hygiene division of the Dispensary in order to focus attention on the fact that syphilis and gonococcus infections are major medical problems both in diagnosis and treatment and in social service follow-up and nursing work. It is proposed that any person who has one or the other of these infections is to be considered as requiring all the resources of the clinic grouped about him. The theory is that the patient should be impressed with the idea that syphilis is his great problem straight through; the ophthalmologist, the laboratory director, all other specialists are consultants to the syphilologist who has his case in charge. Similarly they want to impress the undergraduate student with this same point.

Much was said, I think rightly, by Dr. O'Brien about law enforcement. If we think of law as a matter of formally stating precisely what should be done; what people ought to be required to do in their own best interests and the interests of society, I think every point Dr. O'Brien made is sound. If we think of law in the sense of law enforcement I am not so sure that I follow his proposal that law officers should carry out compulsory treatment of syphilis and gonorrhea. It seems to me that education, in the sense Mr. Kasius has used the term, i.e., of bringing about conviction and attitudes and behavior of individuals, is a process which must precede law and law enforcement. I am inclined to think that in human contact diseases we can do very little with law as such. Perhaps I did not understand the point of view Dr. O'Brien put forward. In any event, a large part of our program must be to work more closely with the constituted health authorities, and the medical, and their organized aids in the voluntary fields, such as this society meeting here this morning.

I should like to say in concluding my remarks that one of the persons here best qualified to discuss the subject is our chairman. As I understand it the task of a chairman is to obey the will of his audience. I believe I voice the wish of this audience that at the end of the general discussion Father Schwitalla should sum up his own views about the problem we have before us today.

CHAIRMAN SCHWITALLA: The Chair uses his plenipotentiary powers and rules the last remark out of order.

The discussion is open to the house, and I am looking expectantly for someone to raise a semaphore to signal to me that this person wants the floor.

I see Dr. Velez sitting over there, and I noticed all through the whole discussion he was taking abundant notes. He had his notebook out and was writing all the time. Dr. Velez, won't you please read what you have written?

Dr. D. M. Velez, Mexico City, Mexico: Mr. Chairman, Ladies and Gentlemen: Certainly, I am very, very satisfied to hear in this meeting all the very interesting matters that you have treated.

A long time ago, in 1920, after a nice meeting here in the States, I began a campaign in Mexico against ophthalmia neonatorum. Yesterday, during the banquet, I said to myself that it is very difficult to spread all these things about the prevention of blindness in Mexico because the conditions in your country and mine are absolutely different. Mexico is a large country, 2,000,000 square kilometers, and more really because the mountains add to the surface of my country. We have only chiefly railroads coming from Mexico to the States and going to the south to Guatemala, to other parts of Mexico and to the Pacific Coast.

Prevention of blindness is a question of education, first, because if you and I with the help of similar societies in Mexico write pamphlets, books and other instructions for the masses that is all right, but I want to point out that in my country all such publications remain in the hands of the educated and do not reach the masses. In other words, we sent our publications to the doctors and teachers and they are not placed among the great mass of the uneducated. Taking this into consideration, we changed the system and are now sending young ophthalmologists and medical students to the country in order to give some explanation to the masses about the prevention of blindness, taking the more important aspects of the prevention of blindness.

One of the most important questions in Mexico is the prevention of working accidents in factories. We are working with the doctors in charge of these factories in order to avoid all kinds of accidents. We have three means for preventing mechanical, chemical and electrical accidents. We have the goggles of mica, and in certain places we use a little cap for pencils. We use some caps in the instruments handled by the workers. We have one other system which is very good. We place a large plate of glass between the eyes and the working instrument. These are the three kinds of improvements which are now placed in the factories of Mexico. Periodically, we see that all these implements are all right.

I shall give a short résumé of my ideas in the general problem of improvement in Mexico. With good roads going to the mountains we can go by automobile very easily. A small car, such as a Ford, will permit us to go into the mountains. It is not difficult. With the use of the small car, the ophthalmological student and other help can reach the Indians. Thus, I am sure we will be able to stop the blindness in the country. The first question is to have good roads so that we can go among the uneducated, among the Indians.

The second thing is that Mexico absolutely must have many more schools. The school is just the thing we need for the education of the masses. Education, as you know very well in the school for the boys, is for the purpose of establishing a closer relationship between the parents and the boys in the schools.

When a mother sends her boy to school that is not sufficient. He comes back to the house. In my country, many times the boy loses all the improvement gained during his schooling because that family of Indians is not interested enough to keep all the knowledge the boy received in the school. In other words, we need two schools, a school for boys and a school for parents. It is absolutely necessary in Mexico to do so because all the boy has learned at school is lost through lack of interest. We now have a large interesting program for developing this school. We call it a country school because it gives a short course. It is not a university school but is for the country. We need it because we need to spread this knowledge among all parts of the country.

There is another problem in Mexico, of which I wish to speak. Last year we appointed twenty-eight groups of Indians, and I hope to see two or three more. Each one of these groups of Indians is different from the others. They are not the same class of Indians. There are twenty-eight large groups of Indians belonging to different origins. They speak Aztec, Mexican, and other different languages not understood by the Spanish speaking persons. They, themselves, do not speak Spanish. About fourteen miles from the center of the city there are three or four groups of Indians on the mountains who don't speak Spanish. I will show you the effort made by my government in Mexico, because it is a very worthy effort.

We have taken three of the pure Indians in each group, without shoes, without dress, without clothes, and brought them into Mexico City where we have a very nice school for them. When these groups come to the school they are dirty, and so forth; but in two months they wear nice hats, vests, brilliant neckties, shoes, and all that is proper. They play golf, basketball, tennis, and so forth. We keep three from each of these twenty-eight groups in school for two years. When we consider that the three Indians of one group are acquainted with civilization we send them back to their group and bring in three more.

I think this is something interesting for you to know because it is the same method the Catholic priests used during the Spanish domination. They treated the Indians very well, and I can say that the conquest of Mexico was made by the cross and not by the sword. The conquest of Mexico was made by the priests and not by the soldiers of Cortez. The priests went into the mountains preaching, and I think they conquered Mexico. We wish to follow the same rules that they followed at that time, by sending teachers to the Indians.

What do you suppose the psychological effect would be of dressing up three Indians in hats and neckties and sending them among the poor people saying, "Look, this is made in Mexico; I am a teacher and I wish to come here to establish a school for the improvement of the hygienic conditions of the people of the village?" We obtain very good results. General rules of hygienic matter are introduced, and rules of eye hygiene are explained by the doctors in the school. We wish to spread this material in all parts of my country, and now under the care of the Board of Health from 500 to 1,000 small books are published every year which are to be spread over the country. Already there is some knowledge among the Indians of the use of nitrate of silver in preventing blindness. The Indians use lemon juice on the eyes, two or three drops. Scientifically, the citric acid is not so strong as to produce the prophylaxis, but it is something of an astringent and at least the eyes are clean. Meanwhile, we have the opportunity of sending the nitrate of silver to the Indians.

CHAIRMAN SCHWITALLA: I am sure we are very grateful to Dr. Velez for his remarks. You have heard of the wonderful conditions in this country, and you have heard of the type of conditions in Mexico. We have a transitional zone in the United States in which the conditions are not quite as bad as they are in Mexico and not quite as good as they are here, and I think Dr. McReynolds had better tell us what they are doing in Texas for fear we might misunderstand the situation.

DR. JOHN O. MCREYNOLDS, Dallas, Texas: I am glad of this opportunity to put the Society straight with reference to the situation in Texas. After an experience of something like thirty-five years' ophthalmic practice in Texas, I am glad to report that it seems some of these conditions have practically been entirely annihilated in Texas. It has now been a long time since I have seen an acute case of ophthalmia neonatorum. Some years ago the American Medical Association put on a campaign for the conservation of vision through a committee appointed for that purpose. Members of this committee traveled over the state lecturing to the people the best they could. There is great difficulty in arranging your lectures exactly to suit your audience. The information conveyed must be so graduated that it can be thoroughly appreciated by all in the audience. So you must have, to begin with, absolutely dependable. medical information to be distributed and to be absorbed and appreciated by the leaders. Then this must be transmitted to the next order, then to the next order so that the people who really need it most will get dependable information in a very few words.

I think we need, most of all, not only the co-operation of the medical profession and the nurses, but the general public, with reference to these well established methods. I have been called upon, for instance, to testify in court with reference to one man whose child was supposed to have lost its vision from the application of the Credé method. The trouble was that the physician who administered the method did not have the support in his community and of the medical and nursing professions; as a result of which the man felt his child had become permanently blind through the application of the Credé method. We must start early enough among all these people to secure that co-operation, and if we do not, we cannot expect to succeed.

There is one other point that I think might be mentioned with reference to that condition of syphilitic origin which is productive of the greatest amount of blindness among our people, and that is diseases of the optic nerves. We know full well the tremendously splendid influence in a curative way of the various preparations that have been introduced into the system intravenously and otherwise, such as the arsenic and bismuth preparations. But it is important that those who go out to teach the people should recognize that these procedures may sometimes be unjustly accused of producing blindness while in reality the fundamental cause back of it all was the disease itself.

Many times within the last year patients have been brought to me with progressive optic atrophy with the history that they had no particular trouble until they received their first injection of arsphenamine. Then, immediately the vision dropped down to be succeeded by a still further fall when the next injection was received. It is necessary, therefore, to apprise these people of these possibilities, and this must come from us. They must be apprised of the fact that there is a condition which intrinsically tends to blindness; that while it is possible these injections may aggravate it, yet it is not necessarily the sole cause of the loss of vision.

This other fact, however, we must consider, and that is, that it is within the range of possibility that these injections may have the effect of liberating and stimulating the *spirochæta* which may be dormant, and we have to take into consideration the possibility of actually doing some harm. On that account, it is well to follow the advice given by Ehrlich himself to approach these conditions from other angles than by the avenue of arsphenamine injections, namely the old-time mercury and iodide preparations.

Chairman Schwitalla: We still have a quarter of an hour more for this discussion, so we might as well remain here for a few moments longer for those who are interested.

Somebody said at a meeting I attended recently that when there was a meeting at which the Mayo Clinic was not heard from it was like seeing "Hamlet" with Hamlet left out. I was cynical enough to remark to the person sitting next to me that I didn't believe that was so. I said, "It would probably be a medical meeting of Hamlet without the graveyard."

If anyone from the Mayo Clinic talks at all, you are going to be overwhelmed with something or other. I suppose it is up to me to take the chance. As is becoming a grave digger, I should like to call on Dr. Benedict to call a spade a spade.

Dr. W. L. Benedict, Head of Section on Ophthalmology, Mayo Clinic, Rochester, Minn.: Syphilis of the eye is on the decrease both in virulence and in incidence. Ophthalmia neonatorum is very seldom seen. While I have no figures derived from statistical studies regarding the prevalence of syphilis, it is my belief that with increase in facilities for social intercourse, with a greater number of holidays, the shortening of our work days, the number of places for drunken revelry decreasing, syphilis is on the decline.

Had it not been for certain discoveries that have been made regarding the treatment of this disease and the very active services of health societies and social workers, syphilis would not be on the decline. While syphilis does not follow civilization, Dr. Engman to the contrary notwithstanding, it is an accompaniment of the facilities for social intercourse. Where peoples are more thickly thrown together and are more vicarious in their habits, and have longer time for drunken revelry, there syphilis propagates in its most virulent form. The malignancy of the disease is also on the decline. There are relatively fewer cases of blindness due to syphilis in this country than in the Orient.

Our esteemed colleague from Mexico has told us of the social conditions in his country. The biological condition is exactly the same in all countries; the difference is a social one. While the betterment of roads in Mexico will facilitate the instruction of the people and their better care, if it allows also for greater aggregations of people to mingle in revelry and festivity, syphilis will increase. Even as their medical treatment is made easier the chances of infection are made greater, and the two will grow. It then becomes a problem for social workers.

Social workers are medical missionaries, and the work of such medical missionaries may be traveling from the doctor's office to the hospital or to the slums. Another problem for social workers is to provide ways and means for social intercourse of people without danger of infection and the spread and propagation of disease.

That this is not altogether a social problem, however, is to be inferred from some things that have happened in this country. If it were purely a matter of knowledge, it would be a simple matter to educate all the people in this country in a short time as to the dangers and the ravages of syphilis. With all the knowledge, however, unless some means can be invented and made practical for the enforcement of certain regulations the effect will be greatly nullified.

We have known for a long time of the ravages of social disease, and it is not without significance that syphilis and gonorrhea are called social diseases. The economic problem of taking care of people who have been rendered functionless, kept out of production because of the unfortunate contamination, was a strong factor in persuading the legislature of the State of New York that the Credé method should be applied for the prevention of ophthalmia neonatorum. That same method has been adopted in practically all of the states in this country. Now a midwife or a physician is liable under the laws of this country if through negligence blindness is brought about from ophthalmia neonatorum.

I think Dr. O'Brien was perfectly correct in his statement that he believed through legislation a great deal could be accomplished. Not only through the matter of bringing people for treatment, but here one of the greatest of our widespread pieces of legislation was brought about through a Constitutional amendment that made it unlawful for any citizen of this country, or any other, to sell liquor in the United States. I believe that amendment, maligned as it has been, has done a great deal to prevent blindness, because in association with intoxication infection from social disease is much more devastating in its effects. The incidence of infection is multiplied under conditions of drunkenness. We have only to turn to the social conditions of the Orient where five and six-day festivals for some occasion are held to observe the over-indulgence in eating and drinking and in sexual indulgence.

The social diseases are prevalent in all countries from the equator to the pole, so the problem of social hygiene is international. It differs only slightly in every country and in different parts of the same country. Laws can be passed that will make it difficult for people to obtain alcohol. The acute drunkenness of this country has subsided tremendously. Chronic alcoholism is being reduced to a minimum, and with the outlawing of houses of ill fame we have spread over the country a great moral blanket. By Constitutional amendment as well as by passing state laws, we are preventing blindness by changing the social conditions under which those diseases which cause blindness are contracted. We are infinitely better off than we would have been had these social conditions not been changed.

Now only a word as regards Dr. O'Brien's paper on the treatment of syphilis. He stated this morning that before marriage, individuals should be subjected to certain examinations to determine whether they were infected. I believe it is true that there are as many people infected with syphilis and gonorrhea after they are married as before, and those people who are infected with syphilis before marriage relatively seldom bear offspring. Syphilis will be eliminated from the world if society is willing to pay the price, and that is social segregation.

The problem of the social worker as I see it in the adequate treatment of syphilis, is to provide as nearly as possible segregation and the making of contacts between those people who are known to be infected, either young or old, and those agencies which can bring about relief.

LUNCHEON CONFERENCE ON SOCIAL HYGIENE AND THE PREVENTION OF BLINDNESS

WILLIAM F. SNOW, M.D., Chairman

Editor's note.—Since the proceedings of this meeting are to appear in forthcoming issues of *Hospital Social Service* the National Society for the Prevention of Blindness will omit the publishing of them as part of these PROCEEDINGS. The program of the luncheon conference consisted of a series of five-minute discussions in the points of view of:

1. Medical Education, William H. Luedde, M.D.
2. Medical Practice, John Green, M.D.
3. Hospital Service, Harvey J. Howard, M.D.
4. Medical Social Service, Miss Edith Baker.
5. Community Education, Harriet S. Cory, M.D.

The National Society for the Prevention of Blindness has in its files a complete verbatim transcription of every meeting and will be glad to extend the courtesy of reviewing its transcript to anyone interested.

Trachoma

HARVEY J. HOWARD, M.D., *Chairman*

TRACHOMA

HARVEY J. HOWARD, M.D., Chairman

CHAIRMAN HOWARD: There has been a trachoma problem in the world for centuries, just how many centuries none of us knows, but I think I am safe in stating that there are probably more trachoma cases in the world today than at any previous time in the world's history. The so-called civilized countries undoubtedly do have less, but in the so-called backward countries it is generally accepted that the number of infected cases is increasing yearly.

From my own personal observations in China I recently estimated that at least 100,000,000 people have trachoma, which means that about 25 per cent of the entire population is infected. Other countries in Asia and Africa have even larger percentages of the population infected.

History tells us that trachoma was introduced into Europe early in the nineteenth century from Egypt. We know that by the expenditures of tens of millions, perhaps hundreds of millions, of dollars, on more or less efficient public health work that some of the better organized countries in Europe have practically eradicated the disease. But, again, I will state it is my opinion, that, in spite of all the money that has been spent, in spite of all the intense effort and time that have been put into the problem, there are probably more cases in the world today than ever before.

Real active efforts directed toward the discovery of the cause of trachoma began about fifty or sixty years ago. Much work has been done. Most of the work has been done by isolated workers here and there. Many methods have been abandoned as useless; many theories have been discarded. On this account our problem has been made easier.

We know what the most promising leads are, so I believe today offers the best opportunity we have ever had for working on the etiology of trachoma. The first speaker this afternoon is Dr. Charles Weiss. Dr. Weiss spent two years in Porto Rico in charge of the Department of Bacteriology and Immunology under an appointment from the Columbia University, and during the last year and a half has been on the staff of Washington University in the

Department of Ophthalmology as an associate professor in experimental bacteriology and immunology; that is, his work is to be that concerned with problems relating to ophthalmic bacteriology.

Dr. Weiss went to Europe last spring and has only recently returned. He made a very careful study of the investigation in trachoma that is going on in Europe. He has also investigated what is being done in this country. He and an assistant with the help of technicians are now working in the laboratories at Washington University on the trachoma problem. I take pleasure in introducing Dr. Weiss whose subject is "Present Knowledge of the Etiology and Epidemiology of Trachoma."

The Present Knowledge of the Etiology of Trachoma

Charles Weiss, Ph.D., M.D.
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Trachoma constitutes a very serious public health problem throughout the United States. There is evidence that the situation is not improving from year to year. In the State of Missouri alone, as was shown by Mossman,[1] there are at least 637 persons who are totally blind as a result of a trachomatous infection. These persons, being pensioners under the present law, cost the State annually $191,100. This figure expresses only a small fraction of the economic loss to the community which trachoma engenders. It does not take cognizance of the 20,000 trachoma patients of this State who are partially incapacitated and are a continuous source of infection to other members of the community. The Oscar Johnson Institute of Washington University is extremely interested in this disease and is carrying on investigations as to its etiology under the direction of Dr. Harvey J. Howard.

It is unfortunate for the scientific worker who is focusing his attention upon the problem of the etiology of trachoma, that, although the disease has been known for many centuries, ophthalmologists are not agreed on the clinical and the pathological definitions of the disease, excepting in its terminal stages. For example, let us take two selected definitions from well-known authors.

Definitions of Trachoma.—Trachoma has been defined as "an inflammation of the conjunctiva, which originates by infection, and produces an infectious purulent secretion. It is distinguished principally by its chronic course, in which is developed a hypertrophy and consequent roughening of the conjunctiva, which forms the most characteristic symptoms of the disease and from which the latter has, in fact, received its name" (Fuchs[2]). According to Morax and Petit,[3] "trachoma, or granular conjunctivitis, is a specific disease of the ocular mucous membrane which is capable of spreading to the cornea and of giving rise to cicatricial changes." It is evident that to Fuchs the occurrence of secretion and hyperplasia is the distinctive feature of this disease, whereas Morax calls attention to scar formation and corneal involvement.

Pathology.—From the standpoint of pathological anatomy, the essential lesions of trachoma are the enlarged subepithelial lymphoid follicles of the conjunctiva which constitute the granulations and finally lead to scar-tissue formation (Saemisch[4]).

Etiology.—Before the etiology of trachoma is solved probably all of the following six questions will have to be answered:

1. Is trachoma primarily a disease of dietary deficiency?
2. Is it a local (ocular) manifestation of a systemic infection or metabolic derangement?
3. Is trachoma the result of a single specific infection, or is it due to a series of infections possibly of similar or of dissimilar character?
4. Is trachoma a transmissible disease?
5. Is it due to a filterable virus?
6. Is it due to a protozoan parasite or other specific microorganism?

Let us take up these questions in the order named. 1. Is trachoma primarily a disease of dietary deficiency? It is now well established that at least one affection of the eye, namely, xerophthalmia, belongs to this category. Dr. Royer[5] recently suggested that "the primary fault permitting trachoma to develop may be a food fault." He raises the question, "May not the fault be either that essential food or vitamin has been absent seasonally or habitually, or that the essential food element has not been utilized?" He believes that we cannot escape the evidence that "if this disease is due to a specific virus it in some deliberate way shows a selective affinity for the poor and underfed of the world. . . ." Up to the present time no epidemiological or experimental researches have confirmed this opinion.

2. Is trachoma a local (ocular) manifestation of a systemic infection or of a deranged metabolism? Many of the European investigators have sought to discover in trachomatous patients a definite clinical background. Some have presented evidence of a tuberculous habitus, of an exudative diathesis, of lymphatic constitution, and of eosinophilia. Others have called attention to the presence of an associated unilateral rhinitis in cases of monocular trachoma. On the other hand, any such correlation of symptoms with trachoma has been vigorously denied.

While it is impossible at the present moment to answer this question, we cannot disregard the possibility that trachoma may be merely a local manifestation of a systemic infection, in the same sense that the rash of scarlet fever is a phase of a general toxemia, or just as cataract in diabetes is merely a localized expression of a deranged metabolism.

3. Is trachoma the result of a single specific infection, or is it due to a series of infections of similar or of dissimilar character, from which the patient may recover spontaneously or under treatment, but which after a certain period lead to cicatricial formation? This very difficult problem may, perhaps, be solved only by clinicians and bacteriologists working together. They would need a large number of cases of conjunctival affections similar to trachoma and would have to follow them from their incipiency until cured or until scar-tissue was formed. In this class of diseases might be included folliculosis, follicular conjunctivitis, papillary conjunctivitis, chronic blennorrhœa, vernal catarrh, Parinaud's conjunctivitis, tuberculosis of the conjunctiva, and conjunctivitis due to foreign bodies, sporotrichosis, and syphilis.

4. Is trachoma a transmissible disease? That trachoma is most likely an infectious disease is suggested by the occurrence of epidemics and by its geographical distribution. Its transmissibility is strongly suggested by its frequent presence in asylums, institutions, boarding schools and among several members of the same family or community. During the recent World War hundreds of conscripted soldiers in the armies of the Russian and of the Austro-Hungarian Empires infected themselves with trachoma in order to avoid active military service. They accomplished this by placing within their conjunctival sacs bits of cotton soaked in the secretion of trachoma patients. Many such cases have been studied by Taboriski,[6] by Kapuscinski,[7] and by Szafnicki.[8] The literature on this subject presents several protocols of experiments on human subjects which are convincing. Thus Sattler[9] in 1881 succeeded in reproducing the disease by inoculating the conjunctiva of a normal subject with the contents of a trachomatous follicle. The period of incubation in his case was seven days. Similarly, Addario[10] (1906) infected three blind persons with the virus and obtained typical trachoma with pannus.

In order to determine beyond any doubt that trachoma is a specific infectious disease, it is necessary to isolate a specific micro-organism or a filterable virus from cases suffering with the infection, to reproduce the symptoms of the disease in experimental animals and to recover the organism (or virus) from the latter. Unfortunately, none of the common laboratory animals have thus far been found susceptible, and even many of the lower monkeys and anthropoid apes are resistant to the infection with material from human trachoma. Moreover, we do not have definite criteria for the diagnosis of trachoma in these animals. In other words, investigators are not agreed as to what experimentally reproducible lesions in monkeys constitute the equivalent of trachoma in man. Indeed, some workers (Hess and Römer[11]; Greeff, Frosch and Clausen[12]; and Heymann[13]) state that because of the poor development of the adenoid layer of the conjunctiva it is impossible to reproduce in monkeys the characteristic lesions (granulations, pannus) seen in man. Still others believe that the so-called complete picture of trachoma in man, including secretion, cicatrization, and pannus, is the result of the action of a mixture of viruses or micro-organisms.

Monkeys, including the Algerian magot and the chimpanzee, are subject, when kept in captivity for a long time, to a spontaneous granular condition of the eyelids. This fact was observed by Hess and Römer in 1905, but seems to have been overlooked by many workers. The virus is infectious if rubbed into a scarified area of the conjunctiva of either a normal monkey or of man.

5. Is trachoma due to a filterable virus? Pfeiffer and Kuhnt[14] (1905) tried repeatedly to produce trachoma in human subjects with material obtained by filtering emulsions of trachomatous secretions, but without success. Their work, however, lacked a very important control in that they did not test the infectivity of the original material or of the residue obtained after filtration. We need hardly reiterate that many experimental animals, including the anthropoid apes, may be naturally resistant to infection with trachoma. This may be true of man also.

Nicolle, Cuénod, and Blaizot[15] (1913) published from the Pasteur Institute of Tunis protocols of two series of experiments on one chimpanzee and three magots, from which they concluded that the virus of trachoma is filterable through a Berkefeld "V" candle. This phase of the problem requires further investigation in the light of modern researches (Kramer,[16] Mudd[17]) on the physical chemistry of the mechanism by which viruses and bacteria may be filterable.

6. Is trachoma due to a protozoan parasite or other specific micro-organism? The search for a specific micro-organism as the cause of trachoma has occupied the attention of bacteriologists and zoölogists since 1881. Numerous fungi and higher bacteria have been incriminated from time to time, but none has yet been accepted as the true cause. Thus the bacillus which Robert Koch[18] found to be associated with "Egyptian ophthalmia" in 1883 was shown by Weeks[19] (1885) to be the incitant of an acute conjunctivitis which

is now known as Koch-Weeks conjunctivitis. A hemoglobinophilic bacillus was cultivated by L. Müller[20] (1897) in Cairo from cases of acute conjunctivitis which he considered to be trachoma. A similar organism was isolated by Edwards[21] in the Philippines in 1910 and by Williams [22] in New York in 1914. Subsequent studies by Arnold Knapp[23] (1904) suggested that Müller's organism was probably identical with the Pfeiffer bacillus.

It is impossible at the present time to decide as to the exact nature of these organisms because the descriptions are incomplete, and because an insufficient number of monkeys was tested with them. Unfortunately, none of the cultures used in the older studies are now available.

It may be pointed out that one of the most important sources of difficulty in the bacteriological study of trachoma is the fact that the conjunctiva of the patient is usually contaminated with a great variety of saprophytic micro-organism (secondary invaders) which may possibly act at first by preparing the "terrain" for the growth of the specific organism and later by inhibiting its proliferation *in vivo* or its isolation *in vitro*.

In 1907, Halberstaedter and Prowazek[24] observed that in scrapings made from the conjunctiva the epithelial cells contained, adjacent to the nucleus, irregularly shaped inclusion bodies, staining dark blue or violet against the pale blue color of the cytoplasm. By examining fresh scrapings from day to day, these investigators noticed that within these inclusions distinct, fine, red, small bodies appeared, multiplied quickly and finally caused the disappearance of the blue bodies. The blue masses within the cell, which later became known as "initial bodies," Prowazek and Halberstaedter regarded as simply reaction products of the cell in response to the action of a virus. They believed that the fine, red inclusions were living parasites for the following reasons: first, they were always distinct and apparently showed evidence of multiplication; second, when material from a trachomatous patient containing these bodies was inoculated into an orang-utan, the animal showed the inclusions (but no follicles or granulations) whereas control experiments with material from other diseases of the conjunctiva were negative. The inclusions could also be transferred in series from one orang-utan to another.

If the inclusions of trachoma are to be regarded as living parasites, they are, in this respect, different from the intracellular inclusions found in diseases due to filterable viruses, such as herpes, yellow fever, fowl pox, rabies, vaccinia, smallpox, warts, etc., and we cannot therefore on this basis alone classify trachoma in this category (Lipschütz[25]). Prowazek's interpretation as to the biological nature of his inclusion bodies has not been supported by the investigations of Bengtson[26] or of Williams.[22]

The inclusion bodies are usually to be found, according to Axenfeld,[27] in about 52 per cent of early, "fresh" or untreated cases of trachoma. Howard[28] found them in 65 per cent of cases among the Chinese. All writers agree that they are seldom seen in cells from the conjunctivæ that show evidence of cicatrization, but most often in the early tumescent stage.

Of what significance, then, are the Prowazek-Halberstaedter bodies in the etiology or pathology of trachoma? This we do not know. One obstacle to the solution of the problem lies in the fact that the inclusions occur more frequently and in greater numbers in blennorrhœa of the newborn than in trachoma (Stargardt,[29] Schmeichler[30]). To add to the confusion, many observers (Lindner, Heymann, Williams) have found similar epithelial cell inclusions in the male and female genital canals and some have gone as far as to suggest a genital origin of trachoma and inclusion blennorrhœa (Lindner[31]). Noguchi and Cohen,[32] and Lumbroso[33] have expressed the opinion that the inclusion bodies represent a distinct type of infection which may be present together with conjunctivitis of various types—trachoma, Koch-Weeks infection, gonorrhœa, etc.

In May, 1926, Noguchi[34] went to New Mexico to investigate the etiology of trachoma among the American Indians. In four out of five cases he found a minute, gram-negative, motile hemoglobinophilic bacillus which bears a morphological resemblance to *B. xerosis*. With this bacterium he produced a follicular condition in nine out of fifteen *M. rhesus* and in one chimpanzee, and then made four successful passages of this infection to chimpanzees, baboons, and rhesus monkeys. Was Noguchi justified in concluding that in *Bacterium granulosis* we have the inciting micro-organism both of trachoma in man and its equivalent granular conjunctivitis in monkeys?

We cannot as yet answer this question definitely. While there have been two reports (Stépanowa and Azarowa,[35] Finnoff and Thygeson[36]) which in part confirm Noguchi's work, other investigators have failed to confirm it (Lindner,[37] Mayou,[38] De Schweinitz and Adler,[39] Wilson,[40] Bengtson).

The problem of the etiology of trachoma is one of the most difficult in the whole field of bacteriology. We must reinvestigate many of the fundamental and historical observations recorded in the literature and establish criteria for the differential diagnosis between trachoma and spontaneous follicular conjunctivitis. At the present time we do not know whether the lesions that look like folliculosis in monkeys actually correspond to trachoma in man, since by virtue of the poorly developed lymph-adenoid tissue of these animals, it may not be possible to reproduce in them the identical picture seen in man. It is for this reason that there has been a diversity of opinion among the fifteen foremost American ophthalmologists[41] who have examined Noguchi's monkeys. Several have expressed themselves as believing that the lesions correspond to human trachoma; others are opposed to this view; and still others are noncommittal.

Noguchi's work on the bacteriology of *B. granulosis* must be continued and the following questions answered: Can we demonstrate antibodies for *B. granulosis* in the blood of trachomatous or recovered cases? Are the Prowazek inclusions produced by the action of *B. granulosis?* Why is trachoma seldom infectious during any but the florid stages? Is *B. granulosis* present during all stages of the disease? Does it grow on the surface of epithelial cells and can it be found in abundance in scrapings of the conjunctiva as was shown to be true of certain other parasitic bacteria? (Lindner,[42] Howard[43]).

It must not be assumed that even if *B. granulosis* is finally accepted as the cause of trachoma, we will be finished with this great problem. On the contrary, several new and promising fields of investigation will remain. For example, what is this spontaneous follicular conjunctivitis which occurs among rhesus monkeys and chimpanzees, and in Tunisian and Italian rabbits? What is its relation to trachoma in man? Is the presence of secretion in human trachoma due to a mixed or secondary bacterial or virus infection? Are there trachoma carriers? And, of course, there will still remain the most practical problem, namely, the development of specific prophylatic and therapeutic measures against the disease.

REFERENCES

1. Mossman, P.: Trachoma in the State's Health Program. Public Health Report, 43: 449, 1928.
2. Fuchs, E.: Text-Book of Ophthalmology. Translated by Alexander Duane, 8th ed., Phila. and London, 1924.
3. Morax, V., and Petit, P.: Le Trachome. Jean Morax, Paris, 1929.
4. Saemisch: in Graefe-Saemisch: Handbuch der gesamten Augenheilkunde. 2d ed., Leipzig, 1910.
5. Royer, F.: Is Trachoma a Deficiency Disease? Jour. Am. Med. Assn. 87: 482, 1926.
6. Taboriski, J.: Experimentelle und klinische Untersuchungen über Trachom und trachomähnliche Erkrankungen der Bindehaut. Arch. f. Ophth. 123: 140, 1929.
7. Kapuscinski: quoted by Taboriski, q. v.
8. Szafnicki, M.: Trachom. Klin. Oczna, 6: 77, 1928 (from Zentr. f. d. ges. Ophth., 21: 46, 1929).

9. Sattler, E.: Ueber die Natur des Trachoms und einiger anderer Bindehautkrankheiten. Bericht u. d. Versamml. d. ophthalm. Gesellsch. Stuttgart, 13: 18, 1881.
10. Addario, C.: La contagiosità del tracoma; ricerche sperimentale sull uomo. Progresso oftal., 1: 345, 1905–6.
11. Hess, C., and Römer, P.: Übertragungsversuche von Trachom auf Affen, Arch. f. Augenh. 55: 1, 1906.
12. Greeff, R., Frosch, H., and Clausen, W.: Untersuchungen über die Entstehung und die Entwicklung des Trachoms. Arch. f. Augenh., 58: 52, 1907; 59: 203, 1908.
13. Heymann, B.: Trachom. Handbuch der pathogenen Mikro-organismen. Kolle and Wassermann, 2d. ed. 8: 623, 1913.
14. Pfeiffer, R., and Kuhnt, H.: Eine kurze Notiz zur Bakteriologie des Trachoms. Zeitschr. f. Augenh. 12: 321, 1905.
15. Nicolle, C., Cuénod, A., and Blaizot, L.: Étude expérimentale due Trachome (Conjonctivite granuleuse). Arch. de l'Institut Pasteur de Tunis. Fasc. III: 183, 1911.
16. Kramer, S.: in The Newer Knowledge of Bacteriology and Immunology. Edited by Jordan & Falk, Univ. of Chicago Press, 1928.
17. Mudd, S.: in Filterable Viruses. Edited by Rivers, Chap. 2. Williams and Wilkins, Baltimore, 1928.
18. Koch, R.: Thätigkeit der deutschen Cholerakommission in Aegypten und Ostindien. Wien. med. Wchnschr. 33: 1550, 1883.
19. Weeks, J.: The Pathogenic Microbe of "Acute Catarrhal Conjunctivitis." New York Med. Record, 31: 571, 1887.
20. Müller, L.: Zur Bakteriologie des Trachoms. Wien. klin. Wchnschr. 10: 920, 1897.
21. Edwards: Trachoma. J. Am. Med. Assn., 54: 965, 1910.
22. Williams, A.: A Study of Trachoma and Allied Conditions in the Public School Children of New York City. Collected Studies from the Bureau of Laboratories. Dept. of Health, N. Y. C., 7: 159, 1912–3.
23. Knapp, A.: Studies from the Pathological Laboratory, Columbia University, 9: No. 13, 1901–04.
24. Halberstaedter, L., and Prowazek, S. v.: Zur Aetiologie des Trachoms. Deutsche med. Wchnschr. 33: 1285, 1907.
25. Lipschütz, B.: Chlamydozoen-Strongyloplasmenbefunde bei Infektionen mit filtrierbaren Erregern. Kolle and Wassermann: Handbuch der path. Mikr. 3d ed. 8: 311, 1929.
26. Bengtson, I.: Trachoma Studies: Origin and Nature of von Prowazek-Halberstaedter Inclusions in Trachoma. Experimental Production in Laboratory Animals of Forms Resembling "Elementary Bodies" of von Prowazek and "Initial Bodies" of Lindner. Public Health Report, 43: 2210, 1928.
27. Axenfeld, T.: Die Aetiologie des Trachoms. Fisher, Jena, 1914.
28. Howard, H. J.: The Eradication of Trachoma among School Children in China. China Med. Jour. 38: 255, 1924.
29. Stargardt, K.: Epithelzellveränderungen bei Trachom und anderen Konjunktivalerkrankungen. Arch. f. Ophth. 69: 524, 1908–09.
30. Schmeichler, L.: Über Chlamydozoenbefunde bei nicht gonorrhoischer Blennorrhöea der Neugeborenen. Berl. klin. Wchnschr. 46: 2057, 1909.
31. Lindner, K.: Gibt es ein genitales Trachom. Wien. med. Wchnschr. 75: 2488, 1925.
32. Noguchi, H., and Cohen, M.: Experiments on the Cultivation of the so-called Trachoma Bodies. Jour. Exp. Med. 18: 572, 1913.
33. Lumbroso, U.: Recherches sur les corps décrits par von Prowazek dans le trachome. Arch. de l'Inst. Pasteur de Tunis, 13: 203, 1924.
34. Noguchi, H.: The Etiology of Trachoma. Jour. Exp. Med. 48: 1 Supplement No. 2, 1928.
35. Stépanowa, G., and Azarowa, N.: The Etiology of Trachoma. Microbiol. Journal 8: 180, 1929 (Russian), Abst. in Arch. of Ophth. 2: 357, 1929.
36. Finnoff, W., and Thygeson, P.: The Finding of Bacterium granulosis in Trachoma. Am. J. Ophth. 12: 651, 1929.

37. Lindner, K.: Ist das Bacterium granulosis Noguchi der Erreger des Trachoms? Arch. f. Ophth. 122: 391, 1929.
38. Mayou, M. S.: Letter to the Editor. Am. Jour. Ophth. 13: 98, 1930.
39. De Schweinitz and Adler, Wilson, Bengtson: personal communications to the author.
41. Personal communications to Dr. H. J. Howard.
42. Lindner, K.: Über die Topographie der parasitärer Bindehautkeime. Arch. f. Ophth. 105: 726, 1921.
43. Howard, H. J.: The Rôle of the Epithelial Cell in Conjunctival and Corneal Infections. Am. Jour. Ophth. 7: 12, 1924.

Chairman Howard: You are very fortunate in having in Missouri a man who by his intelligence and activity has put Missouri on the map in the matter of trachoma investigation and hospitalization. It is not necessary for me to introduce Dr. Mossman; he is known to all of us. His talk today is on the "Present Status of the Trachoma Situation in the United States." Dr. Mossman from Rolla, Missouri.

Dr. Paul D. Mossman: Mr. Chairman, Ladies and Gentlemen: I shall hope that my paper will at least touch on some of the phases of the trachoma situation in the United States, but I cannot hope it will cover it comprehensively or accurately. Dr. Weiss refers to my paper evidently in the fond hope that I will say something in regard to accurate figures on prevalence of trachoma. It is impossible to quote accurate figures. It is easy to quote figures that will not be disputed because nobody can contradict you since they have no better figures. I won't, however, right here in the presence of my neighbors and friends, attempt to put anything of that sort over on you. I will wait until I get farther away from home before I try anything like that.

Present Status of the Trachoma Situation in the United States

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Among members of the white race, trachoma is endemic in several of the South Central States, notably Kentucky, Tennessee, West Virginia, Western Old Virginia, Missouri and Arkansas. In most other parts of the country the disease occurs only sporadically. Among the Indians we find some tribes practically free from it while in others the incidence rate runs as high as 20 or 25 per cent. Accessibility of treatment and better living conditions may account for the low rate in some instances, but there are some variations not so easily explained.

Trachoma is a rural disease. It does not spread in cities, at least in this country. Dr. William Zentmayer told me two years ago that in 1890, 10 per cent of patients treated in the dispensary of the Wills Eye Hospital in Philadelphia had trachoma and that this rate had dropped to less than 0.1 per cent. In 1897 trachoma was added to the list of diseases requiring mandatory exclusion of immigrants. This stopped the source of supply, and apparently treatment took care of the stock of cases on hand, thus preventing spread. When or how trachoma was introduced in the section now affected by it, nobody knows. Certainly it was before the time of any of the present inhabitants.

Trachoma among the Indians is one of the major problems of the Indian Medical Service. Excellent results are being secured, limited only by the extent of the funds at the disposal of the service.

The work that is being carried on by the U. S. Public Health Service in combating trachoma in the white population is done by a co-operative arrangement with the individual states in which the work is done. We now have three hospitals in as many states—Missouri, Tennessee and Kentucky. These hospitals serve as centers for treatment, health education and study of trachoma. The field work carried on in connection with the hospitals differs slightly in the various states. In Kentucky, for example, we have a field nurse who has spent her time since last April in Perry County visiting and instructing old and new trachoma cases and also arranging clinics. Five clinics have been held in that County by the medical officer in charge of the Trachoma Hospital at Richmond. He also conducted several clinics in other counties. The work centered in the one county, however, and by means of it a large number of new cases were discovered and some thirty or forty have been sent to the Hospital.

In Missouri the same plan is being carried out, except that the trachoma district is close enough to the hospital that clinics are held weekly in the county where the nurses are working. (We have two field nurses in Missouri). By experience in an adjoining county during three years we have demonstrated to our own satisfaction at least, that by weekly treatment clinics trachoma can be reduced in prevalence. A considerable number of cases have been cleared up, and the severer ones sent to the hospital for further treatment.

In Tennessee we have a field nurse just starting a similar work with clinics every two weeks conducted by the doctor from the hospital at Knoxville. We also have a doctor in the field making an extensive survey of the prevalence of trachoma. This program should give us some valuable data as to trachoma incidence and along with it a means of getting a goodly number of cases under treatment.

The investigative aspect is not being neglected. Our epidemiologist is still busy in the field in Missouri completing his study of trachoma as it occurs in nature, in the hope of gaining information as to the factors promoting spread of the disease. Our bacteriologist, Dr. Bengtson, is busily engaged in her effort to search out the bacterial cause of the disease. We are trying in the hospitals to develop more accurate methods of diagnosis and more effective treatment.

I have given a brief résumé of what is being done by the U. S. Public Health Service in co-operation with states in dealing with the trachoma problem. The work of the hospitals and other field activities is carried on by the U. S. Public Health Service as a demonstration of an effective means of eradicating or at least preventing the spread of trachoma. It goes without saying that these hospital units should be greatly increased in size or in number in order to serve fully their purpose. This calls for greatly increased expenditures on the part of either the state or the Federal Government or both. While the work of clinical, laboratory and epidemiological research is clearly a proper function of the Federal Government, the eradication of a disease within a state is more properly the duty of the health authorities of the state; but there is ample justification for co-operative aid by the Federal Government in a program looking toward prevention of this disease which may and does spread across state borders. In the light of our present knowledge it appears that health education combined with thorough treatment of existing cases, begun as early as possible, offers the most practicable means of preventing spread of trachoma. A decided raising of the economic status and general educational standards among the affected population would probably produce the same results, but we feel that we must do the best we can now, instead of waiting for the millennium to arrive under its own steam.

Discussion

CHAIRMAN HOWARD: I think we are most fortunate in having with us today one who is known the whole world over as the Dean of Ophthalmologists. I fortunately consider him one of the best friends I have ever had. He lived with me in China for a period of six weeks in 1922. I count his association there as one of the high spots of my life. The following year I spent three or four months with him in his home in Vienna. So not only do I have a feeling of great friendship for him but, together with you, I have the conviction that in honoring him we honor the greatest ophthalmologist that ever lived.

DR. ERNST FUCHS: Mr. Chairman, Ladies and Gentlemen: I feel very much honored since Dr. Howard was so kind to ask me to say a few words about trachoma. Of course, I cannot say anything about trachoma in the United States. We have already heard of it by very competent men, but for myself I am very ignorant about it. I might say something about two countries that are just opposite in regard to trachoma.

The first is England. Dr. Collins was so kind as to take me one day to an asylum some twenty miles from London. Children of the country schools were kept in the asylum up to their fourteenth year and treated for trachoma every day, and were really absolutely cured of their trachoma. When Dr. Collins was in Amsterdam I asked him how it was in the asylum. He said, "We have no trachomatous children. They have been wiped out of the public schools of London."

This proves that a good prophylaxis may really avoid this disease. Of course, it is easy in a country where trachoma is not as frequent as it is in Egypt. In Egypt I believe they now have 26 or 28 special hospitals for eye diseases. They have just brought down the percentage of trachoma from 98 to 92. Better provision is made in this country than in any other country of the world for eye diseases. In other countries there is no provision at all for eye diseases.

For instance, I spent part of a winter in Abyssinia. I stayed there for one month and five weeks in the American Mission Hospital which was directed by Dr. Lembe. Dr. Lembe is a surgeon. He was not an eye man. There has never been an eye man in Abyssinia and there is none there now, although there may be one-half or one-third of the population suffering from trachoma, and others from cataract. Dr. Lembe told me he had operated on thirty cases for cataract although he had never seen a case operated upon in his life. "I don't wonder," he said, "that it was not successful." So I did his operations for him as long as I was in his hospital.

I think there is a very wide field for a society which extends its work over the frontiers of America and more or less throughout the whole world. I think if something could be done in the south countries, and Abyssinia is only one instance, such as Turkestan, Afghanistan and others, along the line of work done in Egypt establishing traveling hospitals, hospitals in tents which would treat the people of neighboring cities and stay there maybe for eight or ten months, it would be of great benefit to those countries.

Years ago, Sir Ernest Castle spent a certain sum of money for work in Egypt. It was decided this sum should be used for establishing such traveling hospitals. I visited the first of his traveling hospitals directed by Dr. McCall which went into lower Egypt and Abyssinia. It was near to one of the cities of Abyssinia and about 300 or 400 patients were attended every day. It was a hospital mostly for trachoma.

There was an Arab who was reading to his patients how they had to behave not to transmit the trachoma to the family, and what people would have to do who have not trachoma as yet to protect them against the trachoma. If told to those people just once, of course, it would be of little avail, but if they hear it perhaps 100 times it gets into their heads like the Koran, I suppose. Of course, it prevents trachoma and we are speaking chiefly of prevention. Education must consist not only of telling people how to behave when they have trachoma, but also how to behave so as not to get it.

CHAIRMAN HOWARD: One of the best examples of an inspired worker who has been working all by herself on this great problem is Dr. Ida Bengtson. She has been working at the research laboratory at Rolla, Missouri, for the last four years. We are very glad to have her on the program today, and we should like to hear from her now. Dr. Ida Bengtson.

IDA A. BENGTSON, PH.D., Bacteriologist, Hygienic Laboratory, United States Public Health Service, Rolla, Missouri: I have listened with great interest to the reports of the two preceding speakers and especially to the presentation of Dr. Weiss. I have been enlightened on certain matters concerning which I have had considerable curiosity, particularly as regards the work of the European investigators whose publications giving details of their work have not been available. As we all know, trachoma is a much more serious problem in Europe and in certain other parts of the world than it is in our own country. It is not surprising that the work of Noguchi should have stimulated great activity in the field of trachoma investigation in these countries.

When the results of Noguchi were announced it seemed that the solution of the trachoma problem was soon at hand. Sufficient time has since elapsed however to show that there is still more to be done before it may be said that this is an accomplished fact. A number of questions have arisen as pointed out by Dr. Weiss.

There is the question of whether the condition produced by Noguchi in Macacus rhesus monkeys was really trachoma. Also it seems that certain monkeys spontaneously develop a condition which bears some resemblance to trachoma and this has complicated the problem. Thirdly the micro-organism *Bacterium granulosis* of Noguchi has been isolated by a limited number of workers.

Considering first the organism itself it may be said that the descriptions of workers who claim to have isolated the *Bacterium granulosis* of Noguchi available to me have been rather lacking in detail and not all in agreement. It is a gram negative rod in one instance "actively motile," and in another case the statement is made that "motile forms were not observed." Stepanowa and Azarowa found two kinds of *Bacterium granulosis.* Wilson found a "small bacillus resembling Noguchi's" with which he was not able to carry out a satisfactory agglutination test because as he states it was extremely difficult to obtain a complete emulsion of the growth. As a matter of fact one of the distinguishing characteristics of Noguchi's *Bacterium granulosis* is the ease with which the growth may be emulsified due to the fact that the growth is extraordinarily soft and moist in young cultures. It has a smooth glistening appearance which is very characteristic. The moist character of the growth has not been emphasized by Noguchi or other workers. It is particularly evident on the special horse blood medium both on slants and on plates in which the colonies coalesce producing an extremely moist luxuriant growth.

A few points in Dr. Finnoff's description of the cultures isolated by him were not in agreement with Noguchi's description, but having received some of Dr. Finnoff's cultures I have compared them with the cultures received from the Rockefeller Institute and find that they do correspond and are apparently the same culture.

In my study of the Noguchi strains, contradictory to the statements of Noguchi, of Finnoff and of Stepanowa and Arazowa, I have found that *Bacterium granulosis* does grow on plain agar and in plain broth, that is agar and broth without the addition of blood, serum or carbohydrates. The agar and broth used have been the hormone modification in which media is made from beef heart the medium being cleared by decanting and not filtered through paper. Very good growth has also been obtained in veal infusion broth, on glycerin agar and on Francis' cystine agar on the latter two of which media Noguchi obtained no growth. Another medium on which excellent growth may be obtained is cooked blood agar containing five per cent horse or rabbit blood and one per cent of dextrose. The use of the hormone media and the cooked blood medium very greatly simplify the task of preparing media and maintaining the cultures.

Curiously the culture produces a lemon yellow pigment on plain agar media. It may be recalled that Noguchi emphasized the production of light lemon or yellowish pigment and ability to grow on plain agar as characteristics differentiating the other gram negative rod which was non-pathogenic from *Bacterium granulosis* which he stated failed to grow on plain agar and was non-chromogenous. However, since the Noguchi culture has been made available for distribution it will be possible to collect cultures from the various sources and compare them with the Noguchi culture and thus obtain a more accurate description of the culture. This is important as other gram negative rods aside from those described by Noguchi may be present. The Koch-Weeks bacillus, influenza-like bacilli and other gram negative rods, several of which I found in a rather long series of cases, may be confused with it.

Having pointed out that *Bacterium granulosis* when once isolated produces luxuriant growths on certain specially adapted culture media and that it grows well on plain agar and in plain broth prepared according to the hermone modification, in fact that it is rather readily cultivable, the question arises as to why it is not more easily isolated. It apparently grows as well or better than organisms like meningococcus and gonococcus which require serum, the influenza bacillus which requires hemoglobin and *Bacterium tularense* which cannot grow without blood or serum. There are several possible explanations. In the first place trachoma is a chronic condition and as is well known the isolation of bacteria from chronic conditions is difficult. It is probable that on account of the accessibility of entrance of harmful bacteria the conjunctival tissues are unusually well protected with lytic substances or have other unusually active disease resisting properties. In chronic conditions there is very likely a delicate balance maintained between invading organisms and the disease resisting substances or properties of the invaded tissues, and there are present therefore a comparatively small number of organisms which are really viable or not so modified as to be able to grow in an environment differing from that in which they occur. One may readily be convinced of the fact that there are comparatively few organisms present by comparing microscopically conjunctival scrapings from cases of acute conjunctivitis, "pink eye," or ophthalmia with trachoma. In the former, organisms may be found readily and abundant growth on plates of suitable media is obtained. In trachoma, in the majority of cases nothing resembling bacteria are to be found and, as might be expected, nothing or very little will grow on plate media. It is easily understood why the filterable virus theory or the dietary theory has its advocates. Even the inclusion bodies are not of frequent occurrence and prolonged searching is necessary to find them. In rare instances there may be found the so-called elementary bodies in exceedingly large numbers emerging from the epithelial cell. If these small forms were viable or able to multiply on artificial culture media we should have abundant growth. However, such does not seem to be the case and it is probable that it is the rod-shaped form from which growth is obtained.

Again there may be other bacteria present in such numbers or developing so rapidly that they overwhelm the more slowly growing *Bacterium granulosis*. In fluid cultures we are annoyed by the persistence of *Bacillus xerosis*, in both the fluid media and on plates we sometimes obtain heavy growths of other bacteria.

However in spite of the difficulties an organism has been isolated by Noguchi and perhaps by several others which gives promise of being the sought for culture. Failure to obtain the organism is probably due, as pointed out, to the inherent difficulties of the problem as well as to the fact that not a sufficient amount of material from a suitable location is collected from the conjunctival tissues, too free use of certain local anaesthetics which may be antiseptic, and there may be other reasons.

Considering the question as to whether Noguchi's monkeys have developed folliculosis or trachoma as raised by Lindner, we may reason thus: Lindner contends that the presence of inclusion bodies differentiates trachoma from folliculosis. He examined the Indian, found inclusion bodies and admits that the Indians have a disease which cannot be differentiated clinically from the European trachoma. Lindner examined three of the four cases from which Noguchi isolated *Bacteria granulosi*. In one the conjunctiva was normal and showed no scars, while in the other two trachoma was still present. Lindner says the monkeys inoculated with the cultures from the trachoma cases have folliculosis, hence it follows that the Indian cases from whom cultures were obtained must have had both trachoma and folliculosis. This may be possible.

Regarding the development of spontaneous granular conditions in monkeys, I may say that I have examined the lids of some 60 monkeys, and have found no evidence of any granular condition bearing any resemblance to trachoma or which could possibly be confused with it. Probably the monkeys used by some of the European investigators have been different from ours. I have seen follicles on the conjunctiva of normal rabbits. Their presence seems to be fairly common in this species but not in the Macacus monkeys which we have handled.

As to the possibility of a granular condition developing as the result of trauma, this may result only in exceptional cases, in my experience. I have had no evidence that slight amount of trauma induced by the inoculation of the conjunctiva of monkeys with cultures according to the method of Noguchi has produced any granular condition, speaking in this instance of cultures other than *Bacterium granulosis*, which I have used for inoculating purposes. Even with the most severe traumatization using repeated inoculations, the conjunctiva usually returns to a normal condition after the acute condition subsides. I have, however, produced a condition which may be said to resemble trachoma, by means of the insertion of a stitch through the tarsus furnishing continued irritation over a period of several months, the conjunctiva being inoculated with a certain culture at the same time that the stitch was inserted.

In another instance a condition which resembled typical trachoma was produced by repeated inoculations of a certain culture. This involved rather severe traumatization. The condition affected the inoculated eye and persisted for several months. It is a question to what extent the trauma was a factor in the result obtained in this case.

As to the effect produced in Macacus rhesus monkeys by the inoculation of *Bacterium granulosis* my impression after inoculating a number of animals according to Noguchi's method is that this species is not highly susceptible, a number of animals returning to normal after the inoculation. There seems to be no question however that a certain percentage do develop a granular appearance and that the condition is transmissible from the inoculated to the uninoculated eye, which fact is perhaps the best argument for the contention that the condition has been produced as the result of the inoculation of the culture.

In conclusion it may be said that the evidence at hand favors the view that *Bacterium granulosis* is concerned as an etiological factor in trachoma. This view would be strengthened by further confirmation by other workers and it seems likely that this will be accomplished. A favorable combination of circumstances, suitable cases from which to obtain clinical material collected to insure the presence of enough viable organisms to initiate growth, suitable culture media and proper incubation, a sufficient number of experimental animals, patience and persistence are the important factors in accomplishing this result.

CHAIRMAN HOWARD: I now take pleasure in asking Dr. Harvey Lamb to come forward and discuss this subject.

DR. HARVEY D. LAMB, consulting ophthalmologist and pathologist, Trachoma Hospital, Rolla, Missouri: It is utterly absurd for me to try to add anything to the knowledge of trachoma after the specialists in this disease you have just listened to have spoken. I have been fortunate in being associated with almost all of these workers in trachoma in the last few years either as consultant for the Rolla Hospital under Dr. Mossman, or at the Washington University Medical School under Dr. Howard.

I wish to touch very briefly on two points. The excellent work of the U. S. Public Health Service here in Missouri has been strikingly shown at our state school for the blind. We always had new cases of trachoma in that school up to 1923. Since that year we have had no new cases, and no cases under treatment in the last five years. Altogether it is true we did not have a great number of trachoma cases at the school for from 1905 to 1923 there were but thirty cases. Two-thirds of those, or 20, had lost their sight before ten years of age. That seems, I think, rather unusual. We do not think of young children as going blind very often from trachoma. One-third, or ten, of those cases at the time they entered the school had vision no better than light perception; so undoubtedly they had had pannus and the blinding sequelæ of trachoma.

The other point I wish to mention is in regard to the diagnosis of trachoma. There is a great deal of confusion, as has been mentioned before today, in the diagnosis of trachoma. It seems that in a great many cases any condition having follicles on the eyelids is called trachoma. It is unfair to a child, if there is any doubt, to call the condition definitely trachoma. One could say, "Perhaps it is trachoma; we can't tell. Perhaps it is a follicular condition."

In the last article that Professor Lindner wrote on trachoma he stated that the Americans have not seen enough trachoma to be sure of the diagnosis. He added, "At any rate, they would have the support of Elschnig (a very famous ophthalmologist in Prague), to support them in calling cases of folliculosis, trachoma." Professor Elschnig thinks the presence of follicles is indicative of trachoma.

CHAIRMAN HOWARD: We have two other Missourians who are on our program today. We have a right to call upon them because we know they can speak with authority on this subject. The first one is Dr. Cheek from Springfield, Missouri.

DR. W. C. CHEEK, Springfield, Missouri: Down in my section of the country, the trachoma belt makes a crescent around the city of Springfield. It starts in the southwest, down in what we call the Crane neighborhood, and goes toward the east where Dr. Mossman's field workers are working in Texas County. We give due praise to the mountain work the U. S. Public Health Service has done in that section of the country. Also, we give due praise to the fact that roads have been improved, new people have moved in and old people have moved out, and the hygienic situation has been improved.

We have only been bothered with trachoma one time in the city of Springfield, in my time. During the 'Frisco railroad strike some years ago, of which line I am one of the oculists, a great many men from the trachoma section were brought in to take the place of the striking men. It took us some two years to clean up the trachoma brought in at that time.

I have no suggestions to offer to Dr. Mossman or anyone else in regard to this, except this: I am a great believer in state rights and also state duties. It is the duty of the National Government, as he says, to investigate and outline the work, and then the duty falls back on the state, back upon the county and back upon the city to eradicate the disease if possible when they are shown the way.

Rotating around in the hub of the U. S. Public Health Service, begin with your public schools and teach them how they can prevent taking this dread disease. Teach the children of these parents who are afflicted with trachoma how they can prevent taking it. Don't spend all the time trying to make a trachoma patient well, because you are not going to do it. You can make them confortable in a way, but to prevent it in the coming generation is better. Many of these youngsters have no disease and have no prejudice, and they can be taught to protect themselves. Follow it through the public schools. Enlist the county health officers and county nurses to give this information wherever it is needed. Enlist those in the state public health work. Dr. Stewart is our State Health Officer. Let him give some time to this. Don't spend all the time in politics. Do some worth-while work is the message I should like to bring all of you.

CHAIRMAN HOWARD: Dr. McAlester from Kansas City, Missouri.

DR. A. W. MCALESTER, Kansas City, Missouri: I know it is getting quite late and I should not prolong the discussion but Dr. Mossman has asked me to discuss his paper. I would very much like to go into the two splendid scientific papers. These two papers are a credit to the two workers, and any scientific body should be honored to have them presented. These interest doctors more than the economic. We are much interested in repeating some of Noguchi's work. We received material from the Rockefeller Institute and have tried to establish some method of differential diagnosis, to no avail. We have been trying to find some cases of untreated trachoma and we have found them very rare indeed. Last year, in India, my son tried to find some untreated cases in certain provinces, and due to the work of the government in using placards scattered all over the country, similar to the ones on exhibition here, he was unable to find a case. Major Cruikshank wrote the other day that he found one case about five weeks old. I hope some data may be forthcoming.

Circulars, posters and placards are doing much good among people who are ignorant of the printed word. There is always some one in the community who can read these and disseminate the knowledge. Parents, no matter of what creed, or what race of people, do not want their children's eyes destroyed by any disease. This disease is a thing that concerns both emigration and migration and religion. You are going to have a rather hard time eradicating trachoma in places like Egypt, until you change the religious views of the people, so that they become willing to destroy their ancestors who have become reincarnated in the form of flies.

There is one thing I want to say to the nurses. I do not believe any of the older men could look at any case of trachoma and not know it is trachoma. I don't think any of the students coming out of the institutions could make a diagnosis of trachoma by the appearance of the eye, yet any of the older men can do it. They can't tell you how they do it, nor can they write a description from which you can make a differential diagnosis of trachoma from certain follicular conditions. Take any of the textbooks and try to differentiate trachoma as you would differentiate conjunctivitis and iritis. It is almost impossible to state in words the difference in these things in order to tell them the minute you see them. I have been called out to several towns to look over a group of cases of trachoma. The people are very much excited; the newspapers are excited. Dr. Mossman was called upon the other day on account of an outbreak of trachoma at Sugar Creek. There was no trachoma there. It was entirely the fault of the district nurse. In the other cases, it was the fault of the nurse and the local physician. There was not a case of trachoma in any of the three towns. Thus, a situation of this kind should be nicely handled; should be handled by the Public Health Service. Otherwise the whole question will come into disrepute among the people, and the splendid work of Public Health Service discredited.

Chairman Howard: I should like to call upon our distinguished guest from Mexico City, Professor Velez, to say a few words on this subject as it relates to his country.

Dr. Daniel M. Velez: I shall be brief because we are late. Trachoma is not an epidemic or endemic disease in Mexico. It is an imported disease. We receive patients from the Orient, Japan, China and Syria. Some others come by way of the Atlantic Ocean coming from the south of Europe, Spain and Malaga; also Italy and Syria. There are two reasons why it is not very severe in Mexico: First, our government is following the same rules that you have here, taking all cases of trachoma at the ports and on the borders.

The Board of Health and the Ophthalmological Society have prepared for the special knowledge of the physicians who will examine the eyes of the travelers, a pamphlet which has been published, and of which we are now making the second edition.

Trachoma in Mexico, as you know, is treated the same as it is here. The diagnosis is rather difficult many times due to confusion with a disease that you call here summer catarrh. This disease resembles trachoma on the lower lids and the cul-de-sac of the conjunctiva, and also in the upper part. It has two classes, conjunctival tarsus and also conjunctival prairie. This is a disease that doesn't produce any infection of the cornea. There are no complications on the site of the cornea, and it disappears very quickly with treatment. These diseases, trachoma and catarrh, are present in the young people. Adenoid vegetations of the nose seem about the same as the anatomical constitution of the granulations in summer catarrh.

Those having trachoma in Mexico are in very good condition, and I think the improvement is not only obtained by the treatment but by the general improved living conditions among the uneducated who come from Syria and China.

In Mexico, buildings are only two stories high. The rooms are very large. We have courtyards in the interior of the houses and the sun gets into the rooms very easily. Hygienic conditions among the Chinese and Syrians in Mexico are improving. The Indian in Mexico is a very clean man. He uses the bath, and the Syrians arriving in Mexico follow his plan. These people come to Mexico and sell neckties on the streets. In two or three months they have saved a little money as they are very economical. I have known Syrians to have a nice capital after two years.

The progress of trachoma under these improved hygienic conditions is further limited by the fine climate that we have. We see the sun in Mexico 356 or 357 days every year. We do not have the clouds that you have in the north of the United States. The sun always appears and we have very excellent effects of the action of the sun. You remember the sun has light and heat. The actinic action of the sun is very interesting, and the progress of trachoma in Mexico is stopped by the actinic rays of the sun. I remember there is a very nice hospital in Denver where you treat many by the use of the sun, heliotherapy. I wish to point out that it is possible in these conditions to produce an improvement in the trachomatous in Mexico.

CHAIRMAN HOWARD: We have several other distinguished men here today and we have a few minutes more before our time is up. We hope that we shall have the privilege of hearing a few words from them.

DR. B. FRANKLIN ROYER: Like the man from California, if no one else will speak I will say a word. First, Dr. Weiss' paper, Dr. Mossman's paper, and even Dr. Fuchs' discussion all go to show that none of us knows much about the cause of trachoma, and that some of us have spoken in the language of others and have accepted and repeated inexact statements.

I am going to challenge mildly the statement by Dr. Mossman about the disease actually spreading across state or borders during the years since he has been working on trachoma. Could Dr. Mossman satisfactorily explain how trachoma got into the great Appalachian Mountain system, how it got among the Indians? Why does it linger there and why does it not spread to the rich agricultural belt? It has never spread from the mountains of Kentucky to the rich blue grass regions. It was pointed out two hundred years ago that the rich marmadukes of the Nile Valley didn't get trachoma.

Trachoma is a disease of poverty and it needs the poverty and everything associated with poverty to prepare the soil for trachoma, whatever may be the cause. Why it should be a disease of poverty in rural districts, and absent in urban districts with both unsanitary conditions and poverty, are things to be studied.

One needs only read some statements of men like McCallum and have them tell you how they see the disease in stage I, as he calls it, thrown into stage II by an invasion of the Morax-Axenfeld bacillus, and how stage III may be hastened by an invasion of the Koch-Weeks' bacillus, and how it may be influenced by the annual summer invasions from the gonococcus in the Nile valley and throughout Palestine, to see how trachoma is influenced by a half dozen known types of infection.

A word about Lindner's work and the discussion of his initial body and Prowazek's and Halberstadter's earlier inclusion body. "The inclusion body is too regularly found in the tissues of little girls with vaginitis, and in the tissues of the vagina of an adult woman with gonococcus infection, giving pictures such as are found in the tissues of the eyes to be accepted as causative agent."

I have had a little talk on the side over here with Dr. Bengtson making inquiry as the regularity with which the inclusion body is found in eyes in those hot countries like Java or Egypt or in Lindner's own clinic in Vienna, as contrasted with its frequency in eyes in this country. To me, neither a bacteriologist nor an ophthalmologist, it would seem to indicate there was a greater frequency of the particular kinds of infection in hot countries on top of trachoma to account for the inclusion body.

This all goes to show we need to re-evaluate the things which have been said. Throw out of the literature that which defies interpretation and begin anew with the work Dr. Howard says needs to be done and that Dr. Weiss is prepared to undertake. I think it is time to begin deleting some of the misinformation that has been passed along that is misleading and not supported by published facts.

Inexact statements ought to be challenged in order to stimulate research and to get the real facts. Epidemiologists are in a position to evaluate the facts when assembled, weigh them in the balance, and if necessary to throw out that which is framed evidence.

Before closing, I want to say that during the summer months a very interesting clinic was held in Minnesota called the Rice Lake Clinic. Around that great lake Indians gather for the purpose of harvesting hundreds of tons of wild rice for their winter supply and for sale. During the last summer a complete study of the health of those Indians was made, funds being supplied by the American Social Hygiene Association and the American Public Health Association, personnel from the Minnesota State Department of Health and some funds from the National Society for the Prevention of Blindness. Some 711 Indians were carefully examined for evidence of trachoma, and about five per cent did have a granular condition of the lids believed by the examiner to be trachoma.

DR. P. D. MOSSMAN: People have come from Kentucky to Missouri and brought their trachoma with them. We have pretty good epidemiological evidence. I am not an epidemiologist, but I have one who says that the disease has spread from the people who came to Missouri with their trachoma. So I think we have some few cases at least where the disease has crossed the state line.

CHAIRMAN HOWARD: I had a case of acute trachoma about five weeks ago in a woman of 55. She comes from a wealthy family from Illinois. We were unable to secure a history of contact with anybody who had had trachoma, yet we are sure that she has it.

DR. ROYER: Dr. Wilder told me of a rich Chicago girl developing a granular conjunctivitis followed by a pannus, two or three consulting ophthalmologists agreed, all fearing blindness. They called in Dr. Hektoen. He did a series of skin tests and, as I remember, found she was allergic to tomato. When appropriately treated for the allergic condition the eye disease which had given a typical picture of trachoma cleared up.

CHAIRMAN HOWARD: I am not going to attempt to summarize this very interesting meeting this afternoon. It is beyond me mentally and scientifically, and from the standpoint of time. I wish we had time to go on for another two days. It takes a meeting like this to put us on a basis of common understanding.

I think we are all agreed on one thing at least, viz., that the etiology of trachoma has not yet been determined. Also I think we are agreed that the first thing to do is to determine the status of *Bacterium granulosis* that Noguchi discovered and about which he wrote two years ago. However, I do not think we ought to put all our eggs in one basket, so to speak. We ought to be able to go on with experiments which would include other phases of the subject.

With a great deal of thought, care and expert advice from several departments not only in our own medical school but from other scientific institutions throughout the United States, we have worked out at Washington University an *Outline of Investigations in Trachoma;* that outline consists of seven typewritten sheets. If we should attempt to project this research all at once, it would cost probably half a million a year. Of course, to attempt such a program all at once would be absurd. No organization is going to stand behind anybody or any group of scientists for that amount of money. However, it is my strong conviction that the time has come when we ought to stop hoping for much result from isolated work here and there, that is a little work done in Vienna, a little bit in Paris, some in Budapest, in London, in St. Louis, New York, Boston and Chicago; but we must get down to real business and concentrate a group of scientists who can attack this problem from all sides. The problem, of course, includes the epidemiology, and in this outline we have put epidemiology first on the list.

ADDRESSES GIVEN AT OPEN MEETING AND RECEPTION ARRANGED BY OPHTHALMIC SECTION OF THE ST. LOUIS MEDICAL SOCIETY

JOHN F. HARDESTY, M.D., Chairman

It gives me great pleasure to welcome to St. Louis the National Society for the Prevention of Blindness on behalf of the Ophthalmic Section of the St. Louis Medical Society.

The first number on our program this evening will be an address by Dr. Velez of Mexico City, and I shall ask the silver-tongued orator of the South, Dr. John O. McReynolds of Dallas to introduce Dr. Velez.

DR. J. O. MCREYNOLDS, Dallas, Texas: In accepting the courteous invitation of your Chairman to speak a few words of welcome to our distinguished colleague, Professor Velez of Mexico City, I must confess in the beginning my utter unworthiness of this very delightful task and I will ask your indulgence and forbearance in my poor efforts. My friends in ophthalmology have forgiven and I hope in many instances forgotten so many of my futile endeavors that I shall indulge the hope that this time also they will extend the mantle of charity in the true spirit of kindness.

One can never know the real glow of hospitality that shines forth perennially among our friends of the Mexican Republic until he has met them on their native soil and under the alluring charm of their native skies. There is something in the delightful and unrestrained expressions of cordiality and fraternal feeling that we meet among these people that has the effect of captivating the mind and winning the hearts of our people. Their history, a checkered history and sometimes a tragic history, has always and always will appeal to us.

It has been said that the land which wears the laurel crown may be fair to see, but twine a few sad cypress leaves around the brow of any land and at once it becomes beautiful in its consecrated coronet of sorrow and wins the sympathy of the heart and of history.

As we look at our colleagues from the Republic of Mexico and think of the splendid battles they have fought and are fighting still,

Dr. Daniel M. Velez

our admiration knows no bounds. Our distinguished guest tonight, himself, has a very romantic and heroic ancestry. Some time ago an episode was related to me that occurred during one of those wars in which the forces of the United States invaded Mexico, and God grant these things may never occur again. The episode was this:

The American artillery was bombarding the fortress of Vera Cruz. The feeble garrison was almost annihilated. The Mexican national flag had been shot down again and again but ever would rise upon the crumbling ramparts the same tattered flag supported by a broken reed. Finally, there was not even a splinter of wood to support this tattered banner and it was at this time that a little sunburned, brown arm grasped the folds of this drooping flag and waved it above the fallen soldiers who died in defense of the fort.

Finally, when the American forces took possession of the fortress it was found that this standard bearer during the final pitiful moments of defense was really a mere boy. When General Scott with his great soldier heart came in and saw this boy among the wreckage of war he took him up in his arms and exclaimed, "What a pity it is that a great powerful nation like the United States in the course of war must be called upon to fire its fierce cannon at gallant lads like this!"

That little boy whose tender fingers grasped his nation's flag until all else went down was the father of our distinguished guest, Professor Velez.

We rejoice tonight, my friends, that the American gunners failed to hit their shining mark, and that the courageous spirit of this gallant soldier lad has found a new incarnation in the fearless and patriotic and scholarly person of our distinguished guest who has consecrated his whole life so well and so freely to the high ideals of our profession.

Now, my friends, to him as President of the Mexican National Congress, as Professor of Ophthalmology in the National University of Mexico, an institution that was founded 100 years before the Pilgrim Fathers landed at Plymouth, as a distinguished and forceful factor in the National Academy of Mexico, and as one of the loyal friends of the highest ideals of our profession, and as one who holds an abiding place in the hearts of ophthalmologists throughout the world where he is known, we extend our outstretched arms of affection and to the little brown hand of heroic heritage we extend our united hands and the best and deepest sentiments of our souls.

The Causes and Prevention of Blindness in the Mexican Republic

Brig. General Daniel M. Velez, M.D.

Professor of Ophthalmology, University of Mexico, and of Military Schools of Mexico, Mexico City, Mexico

I reverently incline my head before the President of the Medical Veterans of the World War, my good friend Dr. McReynolds. I accept as a nice souvenir to me the kind and enthusiastic words Dr. McReynolds pronounced about my father. Certainly, I receive these words with my completely opened heart.

Regarding the second part of the nice speech of Dr. McReynolds about my humble personality, I am sacredly obliged to say to you, and I wish with the permission of Dr. McReynolds and yourselves also to change the name of the very nice position of ophthalmologist you have in Dallas, Texas. Dr. McReynolds is certainly a complete, fine, and magnificent microscope. The microscope as you know is an instrument used by the physician on physical matter in order to make the small things grow. Dr. McReynolds is acting as a microscope with respect to my person. He causes small things to grow, and because I am a very small thing I remember Dr. McReynolds and accept with the condition that you consider always in speaking of Dr. McReynolds that he is a microscope.

In seeking to present to this learned assembly a work of a practical nature, I have allowed myself to state the causes of loss of sight followed by a series of suggestions for avoiding blindness, which I trust may at once be put in practice in Mexico, if we rely upon the good will of the medical faculty, the midwives and nurses, in addition to the co-operation of the philanthropic and pious Mexican women, and the magnanimous and learned clergy as well as the body of educators in the schools. Moreover, at least, the moral support of the Federal and State Governments must be pledged to this work of enormous benefit to the inhabitants of that country. The prevention of blindness in Mexico must be vested in the following: 1. The Association for the Prevention of Blindness in Mexico; 2. dependencies of The Mexican Ophthalmological Society, consisting of (a) an anti-blindness campaign in Mexico and (b) an

Anti-trachoma League affiliated with *La Ligue Contre la Trachome* of Paris; and 3. Mexican Moral and Sanitary Prophylaxis Society.

Campaign Against General Diseases.—Inasmuch as syphilis and venereal diseases, tuberculosis, leprosy and cancer, as well as vices like alcoholism, constitute an important classification of general diseases causing blindness, the campaigns undertaken by groups or special associations established in Mexico should consist of: Anti-cancer campaign; anti-leprosy campaign; campaign against syphilis and venereal diseases; anti-tuberculosis campaign; anti-alcoholism campaign; and anti-trachoma campaign.

These campaigns are most important in the prevention of blindness, inasmuch as localization of any of these general maladies in the eye produces an affection, which through wrong treatment or negligence, frequently causes blindness.

A person whose visual acuteness is less than 1/20 may be considered to be almost blind, with no prospect of improvement, as he cannot do any ordinary work to satisfy his needs. Nevertheless, illness or blows leaving marks or defects may be classified as incurable, partly curable, or entirely curable.

Dr. Izquierdo, in his recent work, "Blindness in the Mexican Republic," considers as blind not only those whose optic nerve cannot transmit a luminous impression to the brain, but also those who have some luminous impression and even those whose visual acuteness is below 1/10; and says that the American Census takers in 1920 considered as blind those who could not distinguish their fingers held at a distance of one foot from the eyes.

This same author, following Cohn, classifies blindness:

I. Entirely avoidable:
    1. Ophthalmia of new born
    2. Ophthalmia of child or youth
    3. Smallpox
    4. Ocular traumatisms
    5. Sympathetic ophthalmia

II. Probably avoidable:
    1. Iritis and irido-choroiditis
    2. Irido-choroiditis and retinitis
    3. Retino-choroiditis
    4. Myopic detachment of the retina
    5. Surgical operation
    6. Diseases of the cornea
    7. Measles

III. Inevitable:
  (a) *Innate*
    1. Microphthalmia
    2. Congenital luxation of the crystalline lens
    3. Retinitis pigmentosa
  (b) *Acquired*
    1. Diphtheritic conjunctivitis
    2. Meningitis
    3. Post-typhoid neuritis
    4. Atrophy of optic nerve
    5. Explosion of dynamite or powder
    6. Complicated cataracts

IV. Unknown or non-specified causes

As the total of those surely curable amounts to 76.7 per cent and if, with Hays, those listed as "probably curable" are considered curable, the high result of 80.42 per cent will be obtained, Dr. Izquierdo says, and only 19.5 per cent will remain as incurably blind.

This goes to show that many of the diseases of the eyes causing blindness may be avoided by obedience to the strictest rules of hygiene; and that to avoid blindness, we ought not only to bend our efforts to curing those who have diseased eyes, but prevent falling ill with affections which may be complicated with blindness.

Causes of Blindness.—Causes of blindness may be divided from a practical viewpoint into: Causes arising from the public; causes arising from the doctors; and causes arising from the lack of our scientific knowledge of the etiology and treatment of certain diseases.

Causes arising from the public include: Lack of cleanliness in person and dwellings; accumulation of dirt and its fatal material and moral consequences; ignorance of hygiene to prevent illness; lack of morality bringing about the contracting and transmitting of venereal diseases; alcoholism in itself, a direct cause and, still further, benumbing and destroying the cerebral functions, leaving the individual exposed to animal tendencies which bring him to many offences against morality and hygiene; besides, the lack of timely attention, for often those with diseased eyes do not consult the doctor on noting the first symptoms of ocular disease, or perhaps employ empirical treatments, a cause frequently of the malady becoming incurable.

Vision Lost Because of Incomplete Medical Teaching.—Little time is given in the medical curriculum for instruction in the anatomy, including histology and pathology of eye diseases. Doctors graduating from schools lacking instruction in this field are not equipped to treat or give advice concerning many diseases causing blindness. It is necessary to teach the pupils practical procedure in diagnosis, for example, to distinguish a disease of the back of the eye from a faulty refraction by a hasty examination with the stenopeic point. It would be good to recommend free courses in ophthalmology for doctors, like those customary abroad, called post-graduate courses. Ferieu courses of the Germans furnish quick and efficient instruction in what is most essential in ophthalmology. Therefore, we have opened such courses, announcing them in the pages of the *Annals* of the Mexican Ophthalmological Society in charge of various ophthalmologists, in order to spread among general medical practitioners a knowledge of diseases of the eye for the benefit of our more needy classes especially. Several young doctors ought to be subsidized by the state, or by some voluntary agency interested in the prevention of blindness, to go to the State capitol or abroad to specialize in ophthalmology and public health so that they might devote themselves upon their return to spreading knowledge on eye hygiene and public health; to give free consultation; to form schools in order to educate general practitioners and midwives along the lines of prevention of blindness.

Dependent Causes of the Scientific Inefficiency of our Knowledge about the "Etiologia" and Treatment of Certain Maladies.—Atrophy of the optical nerve, as well as detachment of the retina whether in myopic eyes or not, requires special mention as being difficult to treat successfully. Cases of congenital blindness among which are found "microphthalmia," "retinitis pigmentosa," "cataracts," still escape science.

Investigation at special laboratories for ophthalmology should always be stimulated and encouraged in order to enlarge the knowledge of the etiology of eye diseases.

Some of the General and Local Diseases That Can Produce Blindness.—Among statistics worthy of mention, of the causes of blindness in Mexico, are those collected by Dr. Izquierdo, those of Dr. Leal, obtained from the examination of 675 blind persons and those of Dr. J. J. Gonzalez of 375 cases of blindness. Dr. Izquierdo has formulated his from 430 cases entered in the National School of Blind since its foundation, and has made them according to the indications of Magnus. Of these 430 cases of blindness, 70.2 per cent were caused by idiopathic eye diseases. Included in this 70.2 per cent of the cases, were 49.78 per cent caused by ophthalmia neonatorum. Next came blindness caused by small-pox in the proportion of 16.21 per cent.

Small-pox.—A pustule of this terrible malady occurring in the cornea of one or of the two eyes can perforate and empty the eye globes, may leave extensive adherent leucomas or at least stains "Nefelions o albugos" that lessen the acute vision in all degrees, even to abolish sight completely. Hence there is the necessity of extending the practice of the vaccination in whatever form it is applied, animal or human. In Mexico the Board of Health makes an intense propaganda and a generous and ample distribution of vaccine lymph of animals in preference to human, and when in any town cases of small-pox are presented or an epidemic develops, a special envoy makes a campaign of vaccination and isolation, to which all the inhabitants of the town are obligated to submit.

Syphilis.—Hereditary or acquired syphilis is one of the greatest causes of blindness. Therefore, the Society of Sanitary and Moral Prophylaxis united with the Society for the Prevention of Blindness could carry on a co-operative campaign disclosing the ravages of syphilis, and pointing out how treatment of the disease may prevent blindness as well as other unfortunate results.

The knowledge of the terrible effects of this social plague are made known in Mexico through conferences, pamphlets, and by word of mouth in the numerous dispensaries in which the city carries on the campaign against the venereal diseases. The greatest advance has been in the requirement by law, in Mexico, of the examination of all applicants for marriage licenses, for not only venereal diseases, but also heart disease, insanity or epilepsy, diseases that are fatal to the generation and therefore, are legal and moral obstacles to marriage. Hereditary syphilis produces interstitial keratitis, which sometimes, even though well attended, leaves centric leucomas with impairment of acute vision. Irido-choroiditis, choroiditis posterior and retinitis pigmentosa (considered by some as of an heredo-syphilitic origin) are the cause of entire loss of or great lowering of the sight.

Acquired syphilis produces "chancre" and mucous plates of the conjunctiva, keratitis, plastic iritis with pupil obstruction, chorio-retinitis with persistent opacities of the vitreous body and subsequent atrophy of the eye globe,—all very active causes of blindness. Optical neuritis of syphilitic origin and atrophies of the optic nerve are terrible complications which should forewarn humanity against the acquiring of syphilis. Blindness, frequently incurable, is a result of syphilis. Many cases of keratitis, called scrofulous, in children and coexisting with ozena, are syphilitic in origin (Lerede) and affect vision to a marked degree. Some brain and meningeal affections with sight disturbances are of hereditary syphilitic origin.

It is important for all to understand the dire effects of syphilis both to the individual and to heredity.

Scrofula and Tuberculosis.—Scrofula and tuberculosis cause serious affections of the cornea, with great loss of its transparency; later development results in tuberculous nodules of the iris, very difficult to cure, and causes the loss of the eye. Both diseases are alike and we have even considered that scrofula may be an early step of the second. So we are inclined to consider both at the same time. Scrofula, we might say, is the superficial form, tuberculosis the deep form; scrofula produces in the eyes keratitis sometimes with pannus that leave stains in the cornea; tuberculosis not only attacks the superficial membranes but also the median ones and the deep ones (iris and choroid).

To prevent scrofula is to avoid stains in the cornea, to prevent tuberculosis is to avoid the loss of an eye. Even when tuberculous affections of the iris and the choroid are treated by medical procedures (tuberculin therapy) pernicious marks are left in the visual field. Prenatal treatment and care check the dangerous effects of hereditary scrofula or tuberculosis, and good hygienic care of the child saves him from having these maladies. The method published by Dr. Calmette, of the Pasteur Institute of Paris, is recommended as a preventive from tuberculosis; and the statistics of Dr. Calmette indicate that children even 12 years old, whose mothers are tuberculous and with whom they are living, have not contracted the disease when preventive measures are taken.

Renal Affections, Nephritis.—Albuminous nephritis is a cause of characteristic hemorrhagic retinitis with loss of sight, especially if a hemorrhagic stain attacks the macular region. Alcoholism and syphilis are not infrequent causes of degeneration of the renal vessels and retinal vessels.

Eruptive Fevers.—Eruptive fevers include exanthemic typhus and measles.

Exanthemic Typhus.—Typhus sometimes incites post-febrile and optic neuritis that may result in blindness. It is therefore important that all measures that diminish the frequency of typhus be encouraged.

Measles.—Measles has, as ocular complications, phlyctenular conjunctivitis and ulcers of the cornea—affections that modify the transparency of the cornea unfavorably and may lead to blindness.

Local Ocular Diseases.—First of all, blennorrhea must be pointed out as a cause of purulent ophthalmia seriously affecting the newborn. Ophthalmia neonatorum, according to Dr. Izquierdo, produces 49.78 per cent of blind people in Mexico. It is of the prophylaxis and treatment of this condition that I shall next speak briefly.

We have all agreed that both the man and woman have to prevent contracting venereal disease, and that any flux, be it blennorrhagic or not, in the woman should be carefully treated, especially during the sixth to the ninth month of the pregnancy and that all possible care should be exercised before and during childbirth. The man affected by blennorrhea should be made to know the serious risk he incurs of infecting a woman and all the evils that his unwise act or lack of consideration can cause the woman and her offspring. The man himself may become the victim of such disease and inoculate his own eyes. This kind of blennorrhagic ophthalmia of the adult is very serious and leaves the eyes very strained and sometimes with iris ruptures or other fatal consequences.

Trachoma.—The most serious of all eye disease occurring in Mexico is trachoma. It is a chronic disease, claimed by us as contagious, and very difficult to cure. It comes to us from the extreme Orient and its development and alarming extension must be avoided by forbidding the entrance to our country of those affected by this disease. Restrictions exist in Mexico as in other nations to prevent the entrance of those inflicted with trachoma. Furthermore, it is necessary to isolate and cure the trachomatous, advising them and their families of the danger they are in of getting such disease. Energetic treatment will cure this disease which, when neglected, frequently results in blindness.

Statistics on the frequency of trachoma in Mexico are not very consistent. According to information given by Dr. Uribe in 1905 to Dr. Wernicke of Buenos Aires, trachoma in Mexico was very rare, his statistics secured in the Central Consultation Office in the City of Mexico indicating a proportion of 23 for every 1,000.

For the guidance of physicians at ports of entry and along the border a booklet has been published by the magazine, *Anales de la Sociedad Mexicana de Oftalmologia*, which is well illustrated with photographs of trachoma and other common eye diseases.

Bathing Pool Conjunctivitis.—At the present time in Mexico we are being very careful with the swimming pools and the regulation is very beneficial as it avoids ocular infections. Already chlorination of bathing pools has been undertaken in Mexico and it is hoped further to reduce conjunctivitis caused from insanitary bathing pools.

Myopia.—Myopia occurs in different forms,—hereditary, congenital or acquired. Its progress is capable of being detained by sufficient precaution, especially in the school. In addition to following good school hygiene in general, it is necessary in the case of myopes to study classrooms, with relation to: (1) Natural and artificial light; (2) seat and desk (height of desk top and position of chair) in relation to the age and height of the child; (3) reading books,—the 14 rulings of Cohn for paper, ink, lines, spaces, size of the letter and its separation; and (4) writing and drawing (conditions similar, paper, ink, pen).

"Straight writing, on straight paper and with straight body" is the rule.

It is very important to change the vocation and the career of the very myopic student from literary career to some occupation that will save the sight.

Ulcers of the Cornea.—Ulcers of the cornea caused by different germs, principally the streptococcus and pneumococcus, in the individual that is weak and suffers an erosion of the epithelium of the cornea, are the cause of the loss of one or both eyes in persons that suffer of dacryocystitis.

Cysticercus of the Eye*.—This condition is prevented by the purification of the water, the careful washing of vegetables, and the microscopic examination of meat and its perfect boiling before eating. Cysticercus of the eye, notwithstanding the fact that it can be extracted surgically and is preventable by adhering to strict sanitary rules, is an unwelcome boarder that in the majority of cases causes the loss of the ocular globe and threatens the loss of the other eye by sympathetic ophthalmia.

Traumatic Wounds Resulting in Blindness.—Accidents from firearms are very frequent. These wounds are sometimes a serious menace not only to sight but also to life itself. To prevent such dangers it should be recommended that only firearms of the best quality should be used, and that inexperienced persons should receive instructions in handling them before using them. It is worth mentioning that many serious accidents are caused by explosions of dynamite and gunpowder. The would-be suicide (in some years very frequent) by applying the mouth of the firearm to one of the temples, generally does not kill but results in the complete destruction of the optic nerve and total and hopeless blindness.

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*Dr. Velez provided a complete discussion of this subject, which it is hoped will appear in some more specialized journal. It is a condition abounding in greater frequency in Mexico than in the United States.

Wound Cutting Instruments.—There are many kinds of wound cutting instruments that cause accidents in any station of life. The floret and all fencing arms have been, through oversight, the cause of accidents notwithstanding the masks that are used, and it is to be recommended that such arms be made of good steel and that the button of the floret be well soldered. Scissors, needles, knives, etc., that are left through oversight in the hands of children, are the cause of serious accidents to the eyes. It should be a fixed and constant rule, that instruments or cutting objects, or even toys with sharp edges, should never be permitted in the hands of children.

Industrial Accidents.—As industry develops in Mexico, the problem of industrial eye accidents becomes increasingly important.

Working Instruments of Laborers.—Dr. Izquierdo does not give statistical data in his afore-mentioned work, with relation to ocular accidents in industry. He only says that they are lower in Mexico than in the United States.

The shaping of metals by turning on a lathe; the operation called by turners, burr; the management of metals in melting; and many other practices in industry, are the cause of serious accidents to the eyes. In Mexico eye protection in industry has not yet been initiated. It would be just and right in favor of prevention of blindness, to engage doctors to inspect and advise in all workshops the means and apparatus for the protection of workmen. In the railways it is very frequent that eyes are wounded by metallic fragments or of burning cinder. Among bricklayers and painters, lime burns in the eye are not rare. The strange silicate bodies in the eyes of the stone-cutter, in the chauffeurs and persons dedicated to automobilism, frequently cause serious accidents to the eyes. Such eye injuries may be prevented by the use of protective goggles or eyeglasses of mica.

Sympathetic Ophthalmia.—We must not forget that the traumatic accident in one eye exposes the other to the influence of sympathetic ophthalmia, a serious affection, that is prevented by the opportune enucleation of the wounded eye when this becomes sympathetic in the remaining good eye.

Industrial accidents, as we have agreed in calling the traumatic wound produced by utensils that workmen use for work in industry, are so varied as industries themselves, but they can be classified as: (1) Contusions of different grade; (2) bruised wounds; (3) cutting wounds, punch-cutting or cutting; and (4) wounds by firearms.

These last two can only be superficial (eyelid, conjunctiva, cornea) or penetrating wounds of the ocular globe and with or without retained foreign intraocular body.

Workman's Compensation Laws obligate industry to pay indemnity in proportion to the damage caused and medical care required. The appraising of the ocular wounds principally depend on the degree of loss of the acute vision and the deformation of the oculo-palpebral region, caused by the traumatism. As a humane and financial measure industries have established protective procedures in order not to lose a workman and to avoid paying indemnities which sometimes come very high. Machinery and utensils that afford less danger have been installed. Such safety procedures include:

1. Apparatus that the workmen apply to themselves (eyeglasses of wire screen, of mica, or simply crystal, goggles).
2. Apparatus used in the utensil or tool itself, resembling the protective band or cap that is used to protect the points of pencils.
3. Apparatus, such as crystal plates that are put between the tool and the lathe, and the workmen; this prevents foreign bodies that come out of the lathe, from harming or destroying the eyes.

Special rules should be given to the laborer by the master mechanic of the workshop, in order that he should be careful in his work, taking care of himself against all that could injure him—traumatic wounds, fire, chemical agents, electricity, etc.—making him understand that an indemnity, however big, will never compensate him for the loss of sight or life itself.

In Mexico we have recommended and made generally known a first aid emergency package for eye injuries, for workmen in factories. It contains dressings for hemorrhage, material for loose covering of a wound and antiseptic medicine, that should avoid much infection.

What has been said proves that much eye disease that leads to blindness is dependent on maladies that can be and should be prevented by careful prophylaxis and adequate hygiene. Further, accidents can be avoided, in a great part, by enforcing adequate precautionary measures; the use of apparatus for the protection of workmen in factories and workshops, and the employment of utensils and machinery of the most modern and best make combined with instructions for their proper use.

Prevention and Treatment of Ophthalmia Neonatorum.—For a country with the education and culture of the United States of America, the knowledge that personal cleanliness and purity in sexual relations of parents often prevents the child from becoming infected at birth is not new. Nor is it new that Credé's method for the prevention of ophthalmia neonatorum is a good prophylactic method when it had not been possible, before the birth of the child, to put into practice the precautions of the mediate prophylaxis.

It is a satisfaction for me, nevertheless, to place before you the effort we are making in Mexico to help the uneducated class of Mexicans with the knowledge ophthalmological science has given us. These people, due to the lack of culture, are not as yet in the position to understand and appreciate the benefits which modern hygiene gives us, and through which we avoid a great number of ills.

I know the care which is taken in the United States with mothers before and during the birth of their children, and I have been able to appreciate the very advanced state of prophylaxis in this country. I was able to see, not very long ago, in more than four months in Milwaukee, Wisconsin, a city of nearly half a million inhabitants, that in none of the hospitals or clinics was there a single case of ophthalmia neonatorum among the babies born. After searching with great care only one case was to be found in the entire city, that of a foreign woman of the lower class, who had given birth to a child in the country, a considerable distance from the city, and away from all medical attention. Mother and child were isolated, and given proper treatment; the child's complaint disappeared without leaving any bad consequences.

In Mexico, a vast extension of territory, away from the cities of relative importance, the people of the lower class do not even have medical resources nor do they ever receive any advice regarding hygiene; and therefore the number of cases of ophthalmia neonatorum and of blindness caused by this terrible ailment is still very high.

With the object of improving the sad plight of our people, we commenced in 1921, a very active campaign against this ocular ailment which causes blindness in babies.

The campaign was conducted as follows:

1. Committees were formed, composed principally of women who in the cities and in the country are able to explain the text of a pamphlet which we now have the honor of submitting for your perusal, the original in Spanish and a translation into English, making an efficient propaganda of the instruction it contains. With

these pamphlets there goes a printed notice offering to supply a small box containing the necessary elements to prevent and cure ophthalmia neonatorum.

2. Free and profuse distribution of this box, or "necesaire," was instituted, thus enabling our people of the lower classes to prevent and cure, if necessary, this terrible ocular ailment.

Following this treatment, with which we have had excellent results and which we are sure is of great benefit to our people, we feel that we are rendering them a real help.

Purulent Ophthalmia.—Purulent ophthalmia is a terrible infection which appears in the newly born on the third day after birth, often causing blindness or, at least, leaving spots on the cornea, which diminish the sight. Fortunately, this fearful ailment is avoidable. The first symptom of this affection is the appearance between the second and fourth day after birth of a yellowish translucent fluid which exudes from between the eyelids and which sticks in the form of small yellowish crust on them. One or two days later the liquid turns into a yellowish pus which increases in abundance very rapidly. The eyelids swell and become red and are feverish. When a similar condition appears some fifteen days after birth it is no longer the purulent ophthalmia of the newborn, contracted, as we know, when the child's head passes through the vaginal canal, but another disease, which may be a serious conjunctivitis, contracted after birth, through indirect contact with the vaginal or other secretions. Just the same it requires the same care.

Purulent ophthalmia of the newborn is usually produced by the mucous vaginal fluid, purulent mucus or purulent gonorrhea of the mother, or by other vaginal fluids ("flowers") different from the first, always specifically containing germs. Such germs consist of the following, named in the order of their virulence: (1) The gonococcus of Neisser; (2) streptococcus; (3) pneumococcus; and (4) staphylococcus.

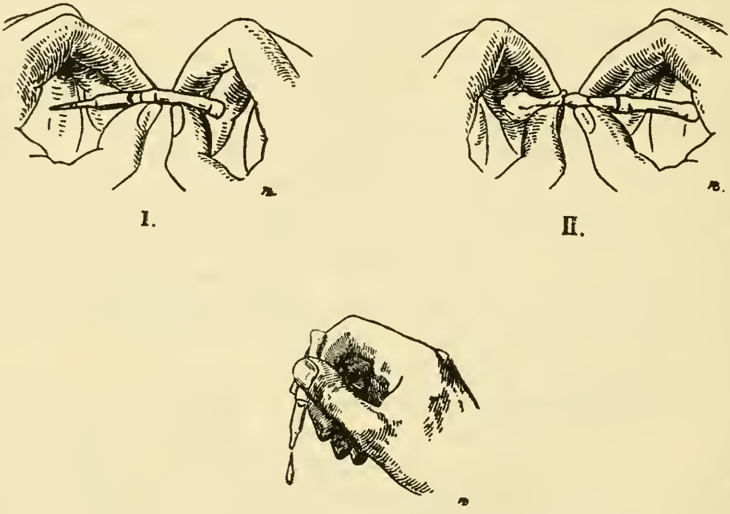
These germs can mix or associate, increasing in this manner their virulence and making the probability of the loss of sight more serious, as they usually cause ulceration of the cornea.

The prophylaxis of ophthalmia neonatorum is effected by placing between the infant's eyelids, one of the following substances, mentioned in the order of their efficiency:

1. One drop in each eye of a solution of silver nitrate of 1 per cent, immediately after this a drop of sodium chlorate of 2 or 4 per cent.
2. One drop of solution of 10 per cent protargol or argyrol.
3. One drop of a solution of ½ per cent of zinc sulphate.

In the absence of the above substances, and only in case of the absolute impossibility of obtaining them, a drop of lemon-juice may be used, although with less assurance of efficacy, due to its low aseptic value.

The prophylactic or preventive treatment does not consist alone in avoiding purulent ophthalmia. We must combat infection and avoid the contamination of the other eye when only one has been infected. For this reason it is necessary to cleanse almost continuously the infected eye and to apply a protective occlusive treatment to the unaffected eye. In maternity houses it is necessary completely to separate or isolate children who are suffering from ophthalmia, putting them in charge of special nurses.


I.

II.

III.

Fig. 1.—First step in prophylaxis: Breaking the ampul.

In the United States 35 State Health Departments, in order to prevent ophthalmia neonatorum, distribute gratis ampuls made of beeswax containing drops (two for each eye) of a solution of one per cent silver nitrate, together with the necessary instructions. In Mexico wax and the manufacture of it are expensive, and in the warm climates wax becomes soft, so that we prefer the glass ampuls.

If, notwithstanding these precautions, the symptoms already mentioned appear on the third day, treatment for purulent ophthalmia must be commenced and a specialist must immediately be consulted.

For the purpose of certain prevention, prophylaxis of purulent ophthalmia ought to be initiated before the child's birth. The prophylactic treatment must begin, not only with the attention

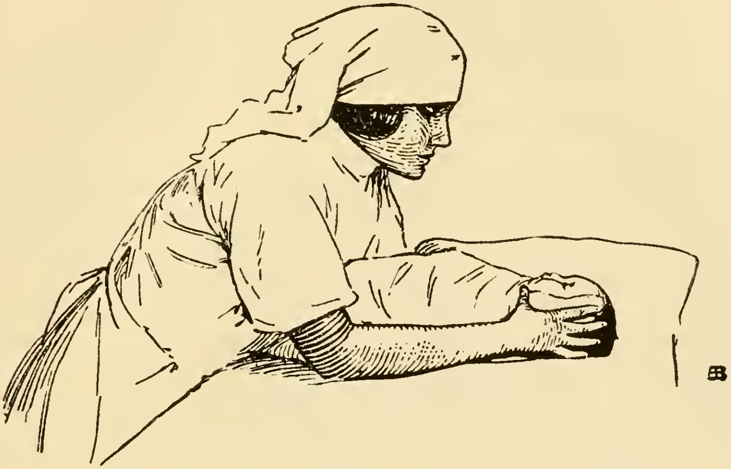


Fig. 2.—Second step: Holding infant's head in position.

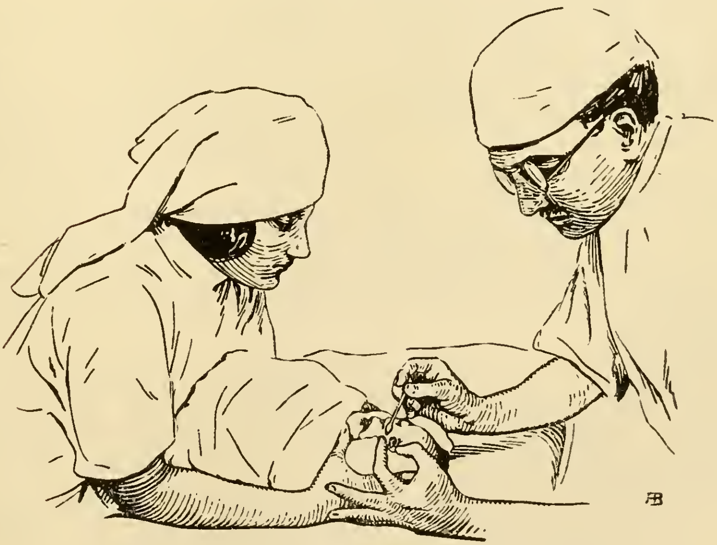


Fig. 3.—Third step: Applying prophylactic drops.

given at the child's birth, but also in the care of the mother during the last months of pregnancy, and during the child's birth. We must take pains, both as a preventive against blindness as well as for general good hygiene, to explain the following ideas which must be regarded as really transcendental:

1. Sexual relations outside of the marriage, for married people must be prohibited in a most definite manner.

2. Young people contemplating marriage must be given clear, precise and definite advice not to marry or enter into sexual relations while they may have some venereal disease, in order to avoid infecting the mate.

3. The mingling of children of both sexes in one bed, or of children and their elders, should also be prohibited in order to avoid infections caused by vaginal or urethral secretions and their transmission from the genital organs to the eyes, which very frequently happens.

It is recommended that all persons suffering with a venereal disease double the precautions in connection with their personal cleanliness, and with regard to the utensils used, clothing, etc.; and further that they isolate the regions affected by covering them with absorbent cotton. Furthermore, it be best that the patient refrain from frequenting public baths, especially pools and bath-tubs, in order to prevent others from being infected. In this connection, a warm shower bath is to be recommended.

It is the duty of every doctor or midwife to advise the Sanitary Board (using for this purpose the cards it supplies) of all cases of ophthalmia in newborn babies which come to their notice, in order that the organization, besides having the statistical information, may know that there is a doctor or midwife attending the child. In case the child has no medical attention, its parents or other members of the family are the ones obliged to give this notice so that the Sanitary Board may provide them, if they are Indians, with a competent person and the necessary utensils and medicines to attend to the child, and in case of need, proceed to disinfect their clothing and utensils.

Summary.—In summing up, I should like to point out that purulent ophthalmia of the newborn is a principal cause of blindness in Mexico. The general census of Mexico in 1900 showed 12,959 blind people, a figure a little below the estimate of 15,000 indicated by Dr. Ramos in the census of 1906. Of these 12,959 blind, the proportion was 149.93 blind men against 100 blind women. As to the distribution of blindness in Mexico, Dr. Izquierdo gives, as a result of his study the following conclusions:

1. Blindness in Mexico is more frequently in the States of Sonora, Chihuahua, Coahuila, Nuevo Leon, Tamaulipas, Durango, Zacatecas,

Aguascalientes, and Territory of the Baja, California, an average of 120 blind for every 100,000 inhabitants.

2. In the lower and tropical regions blindness is less.

3. The blind population is nearly heaped up—41.9 per cent in the central region, which happens to be the most populated.

In closing, I want to make the following points regarding prevention of blindness in Mexico:

1. The study of ophthalmology and practical courses should be obligatory in all schools and medical colleges so that all doctors when graduating should have the necessary knowledge to treat the urgent cases of the eye disease.

2. With the consent of local authorities a doctor ought to be sent periodically to take courses in ophthalmology in medical centers, and medical centers ought to solicit the visit of doctors to ophthalmological congresses in the United States, in order that, on their return to their localities, they may spread knowledge of the treatment of eye diseases. Further, the periodical sending of young Mexican oculists to foreign colleges for post-graduate eye work ought to be encouraged.

3. We have pointed out the advantages of the installation in Mexico City of a permanent committee formed by delegates of all societies directly or indirectly interested in saving sight to unite their efforts to a common end, that is, to prevent blindness in Mexico. This should be done under a carefully considered plan, including the publication and circulation of adequate popular information of prevention of blindness.

4. The moral and practical support of the General Director of Public Instruction of Mexico has been solicited, especially in the popularization of prevention of blindness propaganda.

5. In a great number of the towns of the States, executive and propaganda committees joined by ladies, clergymen, midwives, druggists, nurses, and other altruistic persons are being formed in order to promote propaganda for the prevention of blindness. Among these groups, there will be honorable appointments which should confer distinction, that will be appreciated and will serve as a credential in small towns. In addition, prizes will be distributed yearly among the persons that have distinguished themselves in the fulfillment of their commission.

6. We have taken into consideration that it is not the capital of our Republic that has the largest contingent of blindness. I do not believe it is in the City of Mexico that it is necessary to concentrate the greatest efforts to prevent blindness. Therefore, we consider

the sending of young, well-informed oculists to rural localities very useful in spreading propaganda through personal conferences; distributing of booklets of propaganda; giving objective lessons; and attending personally to sick people, perhaps cases of ophthalmia in the newborn that may happen to come up during their visits. These oculists should be supported by official and voluntary agencies interested in preventing blindness.

7. We are giving our publications a popular character and circulating them amply, especially among the masses in rural districts, through the co-operation of rural agencies and physicians who not only circularize them but explain anything which is not understood.

8. In the City of Mexico we have secured the promise of ten or more oculists who will provide at least medical consultations a week free of charge to needy cases referred by local welfare agencies. Thus about 400 consultations plus incidental medical supplies such as alkaloids, gauze, and bandages are available for the needy every month.

9. In addition, the promise of ten or more of the principal drug stores in the City of Mexico has been secured to fill ten prescriptions referred from oculists, free of charge every week, making available 400 or more prescriptions free per month.

10. Similarly, the promise of more than ten of the optical houses that work in Mexico City was secured to fill a limited number of lens prescriptions free of charge, making it possible to correct the vision of about 200 needy persons a month.

Such co-operation as mentioned in these last three paragraphs will conserve the funds of the Association to Prevent Blindness in Mexico for the more general work of saving sight, such as education and propaganda as well as for the medical treatment of the additional needy eye patients not cared for by the above-mentioned means.

11. Already, with the possibility of conveniently treating 400 needy cases every month, including refractive correction of 200 patients without any cost to public or volunteer agencies, it should be easy to secure the co-operation of social and ecclesiastical groups in combining their experience and motives in a strong prevention of blindness campaign, even to the securing of volunteers to assist in caring for the eyes of some of the diseased, such as the weak and scrofulous children who need cleanliness, proper feeding and clean clothes, in order to be cured completely.

Such needs might easily be contributed by charitable people working in conjunction with the benefit and charitable "Catholic

Conferences." They should establish dining rooms, bath rooms, laundries, and clothes room especially for the needy with serious eye diseases.

CHAIRMAN HARDESTY: I am sure I express the sentiment of the entire Medical Society, as well as the National Society for the Prevention of Blindness, when I say to Dr. Velez that we deeply appreciate his coming these thousands of miles to bring us this very interesting message. We express that thanks to Dr. Velez now.

The next number on the program is an address by Professor Fuchs, and I shall call upon a man who needs no introduction to any St. Louis audience to say a few interesting words about the very interesting work of Professor Fuchs. Dr. Luedde.

DR. W. H. LUEDDE, Director of Prevention of Blindness, St. Louis Society for the Blind, St. Louis, Missouri: It is both an easy and a difficult task to introduce Professor Fuchs. It is so easy to do because everybody knows him, and yet it is so difficult because as you know all about him introduction is really impossible. However, relatively few of us who studied his textbook for years know that originally Professor Fuchs made a very important contribution dedicated particularly to the causes and prevention of blindness in a 250-page book that was written nearly fifty years ago. At the Fourth International Congress of Hygiene in 1882 a prize of eighty pounds was offered by some unknown English person for the best essay on the "Causes and Prevention of Blindness." The prize was awarded to Professor Fuchs in Paris, France, on the one hundredth anniversary of the Foundation of the First Asylum for the Blind by Huey. The report of the jury was therefore issued in French. I shall not ask you to listen to the comment I might have prepared on Professor Fuchs' work, but I ask you to bear with me while I read a translation of the report of that jury.

It stated that "the essayist, writing under the name 'Viribus Unitis,' through a combination of his personal experience as a clinician with a complete knowledge of the special literature of the subject, had embraced all phases of this problem in his presentation. That he had written so competently, with such exactitude and with a breadth of understanding and high idealism that all members of the jury were profoundly impressed.

"Keeping always foremost the practical and philanthropic purposes of this contest and accepting as fundamental a definition for blindness based on the state of dependence, social and economic, of the blind person, this author has known how to be thoroughly comprehensive and scientific and yet avoided superfluous statistical details and all considerations of pathological changes and therapeutic processes not directly pertaining to this subject. His thesis presents an ensemble, well co-ordinated, of which each chapter may also be consulted separately with profit. Throughout it the first place is given to a study of prophylactic measures which promise to lessen the amount of incurable blindness.

"Also the jury believed it was within its rights if it expressed a desire to have this remarkable memoir published as soon as possible and translated into other languages either through the agency of the English Society for the Prevention of Blindness or by some other means. It might be interesting to recall the names of the members of the jury who made this award fifty years ago. None of them stood higher than the name of the man to whom they made the award stands today."

Let us remember as physicians that while it is true that the practice of ophthalmology in all lands is devoted to the conservation of vision and the prevention of blindness, Professor Fuchs' book clearly demonstrated that the clinic hospital and laboratory alone even at their best are not sufficient for the most successful efforts toward these ends. The intelligent and well-controlled co-operation of physicians, teachers, parents, publicists, architects, hygienists, eugenists, nurses, midwives, social economists, illuminating engineers, printers, and so forth—in fact, of all the people all the time is needed.

That is why we have the National Society for the Prevention of Blindness in addition to our medical efforts, to initiate and coordinate actions that may bring about the results that we should like to see accomplished.

Professor Fuchs' prize essay is out of print. I did not see a copy until Mr. Carris secured one from the Russell Sage Foundation last summer. To those of us who read this remarkable volume today comes the realization that therein is given to the world its "Decalogue" for the prevention of blindness. It contains the suggestion and often the detailed instructions according to which all that has since been done in this field of human endeavor has been developed. Professor Fuchs is the great leader who calls humanity forth from the bondage of darkness, of ignorance and indifference, and points the way toward the promised land where every man shall know how to conserve his own eyesight and all shall work together so that needless blindness may be banished from the face of the earth.

It is a great honor to introduce Professor Fuchs to you this evening. He will speak on some symptoms of ocular disease that are interesting alike to the general physician and to the oculist.* Those who happen to be among us who don't belong in either class, I am sure will be equally interested.

Chairman Hardesty: Dr. Luedde has asked me to interrupt the discussion just a moment. He has an announcement to make.

Dr. Luedde: As you know, when we discussed the matter of the guest of honor, the National Society asked us to provide a fund for transportation for this guest. The man chosen was Dr. Velez of Mexico, because we wanted the contact with the southwest, and to extend our work for the prevention of blindness in that direction.

Very fortunately, Providence arranged it so that Professor Fuchs, traveling to Mexico, could be here also at this time, so we had two very distinguished men with us.

My reason for appearing here at this time is to ask that this matter be put on record. Professor Velez just told us that the check we sent him for transportation had not been received before he left, but that he now received notice that the check was received at his office. He said, "I want you to know, Dr. Luedde, that we will accept the check from this Association but it will not be used for me or my expenses, but to form the nucleus of a fund to which I hope to add in order that that new, dreadful scourge that has afflicted certain cities and little villages in Mexico [cysticercus of the eye which he just described] will be investigated and stopped." The fund raised by our members here will be used in Mexico to start a work which will be of great scientific importance and humanitarian effect.

[*Editor's Note.*—The meeting concluded with the awarding of the Robert Johnston Essay Prizes by Dr. Arthur E. Bostwick, of the Public Library of St. Louis.]

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*Since "Subjective Symptomatology of Ocular Disorders," by Dr. Ernst Fuchs, appeared in the *American Journal of Ophthalmology*, Vol. 13, No. 2, February, 1930, it is not printed here, but a copy of the reprint may be secured upon request of the National Society for the Prevention of Blindness, 370 Seventh Ave., New York, N. Y.

Vision Justice for the Young Child

EDWARD M. VAN CLEVE, *Chairman*

Vision Justice for the Young Child

EDWARD M. VAN CLEVE, Chairman

CHAIRMAN VAN CLEVE: The hour of our meeting having arrived, we will proceed.

Since the early days of the National Society for the Prevention of Blindness, when we were told by a physician of prominence that there was only one cause of blindness that could be prevented, this Society has found so many different lines of activity that even those of us who were in at the beginning and thought we had more than just one problem, are ourselves surprised. That one cause, of course, you know was ophthalmia neonatorum, and true it is that at the beginning most of the efforts of this Society were put upon the diminution of the number of cases of blindness that should come into the schools for the blind from this particular cause.

The tremendous success of our contest with ophthalmia neonatorum has been announced from year to year. Dr. Royer yesterday indicated that now those children coming into the schools for the blind who are there because of ophthalmia neonatorum is less than ten per cent.

But the Society found many other causes of blindness and impaired vision to attack, nineteen of them if I remember aright. In all of the lines of effort which we have made, one of the most promising is this attacking the problem before it shows itself in any school. The sight saving movement was a great advance upon anything that we had done before.

Out of that grew this movement which is illustrative of the training of various persons, particularly the public health nurse, to discover what should be done for the child of pre-school age. So in recent years through the active efforts of one of our staff who has been giving her entire time to this work and has been heard all over the United States—perhaps I should also say seen throughout the United States—we have been advancing this phase of our service. I am glad to introduce to you Miss Smith of the staff of the National Society who will talk to you and show you some of this work this morning.

Demonstration of Vision Testing of the Pre-School Child

Mildred G. Smith
Director, Nursing Activities, National Society for the Prevention of Blindness

I well appreciate that, to a good many of you here, vision testing is not only familiar but a part of your very own work, so that you are more than familiar with it. It is with no idea of presenting something new that a vision testing demonstration is being given today, but rather to help bring to mind some of the particular points which you, as teachers of others who are to do the vision testing, should stress. These points have been brought to my attention by those who are doing or are to do the actual work themselves. Their questions have, of course, clarified their needs to me and I hope to pass the answers on to you with the hope that they may be helpful.

In discussion of vision testing for little children, I, of course, appreciate that very often those of you who are interested encounter a good deal of skepticism as to its possibility in public clinics and in public schools. That feeling is due to a consciousness of the lack of time, the great pressure of all these programs and, in the smaller communities, to the lack of sufficient facilities for securing satisfactory correction.

I feel that we have more than vision testing to accomplish in vision testing. We are educating to the need of vision testing. If, in the general health examination of the child, we do not include an inspection of the eye and a vision test, we are simply helping to prolong that period in which people do not give the eye its place in the field of health work. Too long it has been considered that the eye was a mechanical thing rather separate from the health of the body as a whole. We must help to correct so wrong an impression, giving some idea of an eye inspection, of a vision test when the general health is being inspected or examined so that the parents at least learn to appreciate that eyes may be influencing general health, and in its turn general health may be influencing eyes.

We want corrections, of course, but we cannot think only in terms of corrections or we would be discouraged in many parts of our health program. We are educating these children who will be parents of the next generation. If they remember that a vision test was included in their health examination, they are going to be much more ready to ask for it for their children. So we can be interested and give something of real worth even though immediate results are not as satisfactory as we might wish.

Then there is the pressure of time. There are so many things we wish to do for children that there cannot possibly be time to do them all. That is perfectly appreciated. As more people become interested in, and see the need of, sight conservation, eyes will be inspected just as are other parts of the body. The greater the number of people interested, the greater will be the demand for, and possibility of individual work in this part of the health program.

The amount of time consumed in testing vision of children is not as great, I think, as we sometimes tend to believe if we have not actually tried to work out a basis in practical terms of how we can lessen the time required for each vision test. I do not think it is to be hoped that vision testing can ever be as rapid as some of the other types of examination. We have to adapt ourselves to the individual child. We can't have a child unhappy, we can't have him antagonistic. We can look at the teeth and tonsils no matter what the mental attitude of the child. We can't hope for the speed in eye work where ability and effort are to be considered. We probably will always have to do individual work with these little children; group testing seems hardly logical. The time will be lessened if we will spend some of our own time first in securing those mechanical things which make for accuracy. Let us spend our time in preparation so that, when we actually work with the child, we get our results as quickly as possible.

We want first to think of equipment. Most people would like, as you teach them to do vision testing, to have you direct them exactly as to what to get, where to get it, and how much it costs. All of us would like such help. There is equipment such as I am using for demonstration that can be bought, but it is too expensive for most small schools and small clinics. We must know what to advise even though we can't name definite equipment. It is perfectly possible to have good equipment without the expenditure of much money.

The chart to be used should be clearly and accurately printed, and so placed that it can be adjusted to the various heights of the children coming to the clinic or being seen in the school. If there is any way possible the chart should be artificially lighted. Very often there is electricity in a building but it is not just in the place that you want it. I still consider that in that situation lighting is possible. You can get extension cords. You can get new plugs, and other apparatus. Urge those whom you are helping to make every effort to secure artificial light. That is to their advantage as well as the child's. With conditions the same from year to year, from time to time of examination and inspection you have records that are comparable. If you have one amount of light one year, and another amount another year, your work is not being as valuable as it could and should be. Artificial light therefore is to be desired. We know, of course, that natural light is the best light there is, but natural light varies. The amount of light on the vision chart ought to be constant.

I have a little music rack that may be of interest to those of you who are helping those that may be making vision tests who have to carry their equipment from place to place. It is the best music rack I have found, and is entirely satisfactory to me, at least as a holder of a chart. The chart can be held upright. It can be lowered and raised to as high or as low a level as you will ever need. It costs $3.00. It is known as the "Lone Star." I don't know who makes it. I found it in a small city store. It isn't necessary to have that particular make but rather that what you use have those qualities. I happen to prefer the linen chart because I can keep it rolled up. It is important to have a clean chart.

We must then consider lighting equipment. Anybody can procure a gooseneck light which, because of its make-up, can be placed so that there is sufficient light, without glare. Place that light to the front and to the side and within two feet of the chart so that the maximum is received on the middle or lower part of it. Two lights in a long trough such as I have are more satisfactory because they give light the full length of the chart.

Whether or not we have sufficient light can be determined with a foot-candle meter. I do not know how many of you are familiar with this device for measuring light. Certainly I wish that I, as a county nurse, had known such a thing existed. Being able to measure light does not necessarily mean that sufficient light is assured. But would it not be helpful to have proof instead of just an opinion as to the amount of light? I knew, but I couldn't show actual figures to prove that children on one side of a poorly lighted room were working in perhaps half as much light as those children seated near the windows. From both groups of pupils, equally good results were expected and equal happiness in accomplishing those results. Yet conditions for work were not equal. Proof of my suspicions often would have led to an improvement—opinions often met with argument only. Then, too, in knowing the number of foot-candles of light on the chart, my records would have been more nearly comparable and my judgments more fair.

These simple pieces of equipment we can have. The school nurse doesn't need a portable rack, perhaps. She can put a board on the wall that can be raised or lowered. A gooseneck light can be set on a stool or chair in order to have the light in the right place. There are better arrangements. There are satisfactory arrangements which I think are within the range of every teacher, nurse and doctor doing vision testing.

There are many things I think all of us should think about in our work in conservation of vision; vision testing is but one. It is the definite thing that we can demonstrate to others, but it is only one part of it. There is that great big field of positive health, including those things we can do for large numbers of children even before we have time to do the individual work. I do not wish right now to take time to discuss that. The children have come from the school and I don't like to ask them to wait. They soon tire, and they are missing something of fun in their own school.

On the table in the first lobby is a reprint from an article I was asked to write for the *Public Health Nurse.* In that are many things that you all know, but in it I did try to put answers to questions as they come to me in my field work. If you are interested you can get some of those and so have as wide a discussion as I think should precede most vision testing demonstrations. It is unfortunate for any person to feel that vision testing is the only part of the sight conservation program.

The children who have come are from the kindergarten of one of the public schools here in town. You who live in St. Louis know that St. Louis does do vision testing in its schools right from the very first and that of course is a tremendous advantage to its children.

As we learn to appreciate that seeing is a matter that concerns the mind very largely, we recognize the fact that this must be a game, and a very happy one. We may make that game somewhat as you wish or as I wish; there need be no definite formality or method, but rather the idea of fun and interest maintained. The game must not only be fun, but must be perfectly understood.

The game is taught with a big picture that we easily see. You know the idea, to point down and up and over, and over in order to show whether the child sees which way the little legs point. Sometimes we pretend this is a picture. Some children pretend that it is a table, or that may be that is the way a very little boy or girl would draw a picture of a cat or horse, whatever it is that has legs. They watch the direction of the legs and indicate which way they point. So they are going to learn that first of all.

I don't want to have you over encouraged. Kindergarten children are the easiest ones to work with. The child who has not played with other children very much has not learned to follow suggestions. I am thinking of the child who comes into the clinic who may not get it as quickly as the child accustomed to doing those things in the kindergarten. A child of five gets it very easily. With a child of four it takes more time, and he may not get it the first time. I understand from specialists that it is well to encourage the use of both hands.

I don't think there is any doubt that they have the idea; they have gotten it very quickly. Miss Brown is helping me this morning.

These cards cover everything we don't want seen, and so expose that which we do and are a great aid in concentration. I think it is worthy for use even with older children than these because you simply blot out the rest and therefore put the attention on the one particular thing you want seen. The idea of the game is not new, but we had the opportunity of sticking right by that one thing (which most of you in general work cannot do) to find out what in that previously used method makes it adaptable to these little children. This hole will expose several sized letters. We hold it squarely so that there is no tilting and confusion, and we hold it flat so that there is no shadow. We do everything we can to relieve confusion and thus aid concentration.

After we have learned the game, we look through the window. We know the game and we are accustomed to looking through the window. We now go to the goal line which is twenty feet away. I didn't step off the twenty feet, and I didn't guess it. I measured it with a tape-measure, again being sure to be fair to the child. Looking at small objects from this distance is not usually done by these little children. They must become accustomed to the distance. Often a child will hesitate at this time just because he isn't accustomed to distance. With a smaller child we might have to start at five feet or ten feet, before we could work at the twenty.

Now she must become used to having a card appear and disappear in front of her eyes. With these children, each individual step would not be necessary with each child I am sure. They have chosen responsive children for me, children who would do this well. I am going through it in detail just as you might have to do it for the younger child or the child with not the same previous opportunities.

Now the real game comes. Peek first with one eye and then the other. If she misses a vertical or horizontal we give another opportunity, two out of three being considered satisfactory. Sometimes with a little child we may have to do a little more than that. I stand away from her so she is free to hold her head in any position she may wish in order to see clearly.

A child at this age if interested is active. We supply some unnecessary activity, it may seem at first, but big muscle activity is an essential. Toward the last lines, we are very glad to have them look at the pictures close to and far away in order to compare the speed and accuracy. If the child at the chart is quick, definite and accurate and at the twenty-foot line has to make a great deal of effort and is much slower in his definite decision, we may suspect he is having to work pretty hard in order to see clearly.

We try never to have our card cut or held so that there is a larger picture visible than the one we wish them to see. If you wish them to see a little one, and the big one is visible, the attention may be divided between the two.

The consensus of opinion among the doctors I have visited in my field work seems to be that we might consider a 20/30 reading normal acuity for these little children. That is, if their reading is as good as 20/30 in both eyes and there were no other indications to make us suspect poor vision or eyestrain, we would not refer that child for medical examination.

We have other things to do in an inspection. If you are teaching, please call the attention of those who are helping you not to use the same cover for more than one child. You will not want to risk the slightest possibility of passing any infection from one child to the other.

The other day I was talking to one of the pediatricians who makes general pediatric examinations for one of the oldest clinics in New York City. He said, "I am awfully interested to know that more of this work is being done in our pre-school clinics in New York City because in my own practice I have found that I have failed to give the child what is due him. I have given him an acuity test only where it seemed to me there was some special indication. A child I have taken care of since birth when in the third grade of school was brought to me because of inability to do school work. I found that child to have very poor vision. I, as a pediatrist, had failed. I should have routinely examined the child for acuity of vision and referred it to the ophthalmologist if I found eye difficulty."

There is a great difference in children, of course. One child is nervous. If you say, "One, two, three, peek" (slowly), he wishes you would hurry. Another child is simply undone if you say, "One, two, three, peek" (rapidly). We should not go through the same routine—that easily makes us a little dull in our work—but should adjust ourselves to the different personalities. We ought never expect these children to adjust to our personalities.

I think when children respond so well when playing with a stranger, when conditions are entirely new to them,—a strange place, a group of people watching them,—you must realize that among their own circle, among the people they know, it is going to be easier for them than here. It isn't a matter of being expert so much as it is a matter of enjoying it, and surely all of us can do that when a game is being played not only with but for children.

We never say, "No, don't do that. If you don't see it, don't do anything." There is no negative to this. Let's keep it on the positive effort side.

Of course you can appreciate right away that with the foreign speaking child this silent method is a great benefit. They can do it whether you talk the same language or not. I had the pleasure of testing in a Chinese kindergarten. I do not speak Chinese and they do not speak English, but we played the game very easily. They are very reserved little children, and I thought perhaps it would be hard but I was quite mistaken in that. For the children in the deaf and dumb schools we had something they could do equally well as the normal child, and they are awfully happy to do it. I think for the child already handicapped it is especially important to rule out other handicaps.

There is a little disposition on the part of this child to hold his head slightly to the right. His acuity is 20/20 but he holds his head in a peculiar position in making that reading. It doesn't seem natural to have to hold the head to one side in order to see. Let us have someone who does know the negative—the medically trained person—find out.

I think in all the health work it would be well if we had more help in learning to recognize the normal, so far as we know it. For us who are nurses and teachers, that is the important thing. If, in development or response, the child varies from normalcy, let us refer them on that basis rather than to try to think of what it is that is wrong.

Everybody read 20/20. I think that is very good indeed.

We are interested not only in the acuity but in other conditions of the eye. We know that if a child has a turning in or out of the eye that child should be reported early. School age is rather late. Sometimes there is a turning slight enough so that we don't notice it in ordinary observation. So we are interested in applying this test that we nurses and teachers can do to find whether there is any suspicion of muscle imbalance.

I usually take a white-headed pin and dip it in red paint. We have a white-headed pin here; it ought to be more interesting. Watch it go around and around and around. Of course, if you were actually doing it, you would be in front of the child. I am going to cover one eye, and I am going to watch that uncovered eye to see if it has to move in or out, up or down, in order to be in exact position with the other eye. The normal eye, as I understand it, will, even though covered, be fixed on the pin just as the seeing eye. If you watch the uncovered eye and it has to move, you and I who are making inspections may suspect muscle imbalance. These eyes I am now inspecting are very steady.

Of course, I am interested in the appearance of the lining of the lids, and the eye itself. If his acuity had been less good than 20/30 in both eyes, or if he had to hold his head or body in an unnatural position in order to see clearly, if he had been very much slower at the twenty-foot line than close up to the chart, if the appearance of the eye was not that of the normal healthy eye, I, as a public health nurse, would refer him for medical examination.

We are indebted to the parents, the school principal, and the kindergarten teacher as well as the children for the help they have given. I know we all appreciate this co-operation.

QUESTION: Do you use all these tests on all the children?

MISS SMITH: Yes.

QUESTION: Do you give them a teacher's chart?

MISS SMITH: That is done in several places. It is up to the local official health and education agencies to decide on the plan of procedure in the school. I think it is too bad to have any professional group say, "We don't have any time to do it." We are not urging the teachers to do it. I have been both a nurse and a teacher, and I was equally busy at both times. The decision as to "who," ought not be based upon "who has the time," but "how can we best arrange to give the child an opportunity to develop the best possible vision as well as other health." I think it is very advisable at least to pass out the big letter E ahead of time so that the game is taught.

In Missouri the teachers do the vision testing. Each teacher should have a chart and should be given more than printed directions. Printed directions do not explain the psychology, the interest in the individual. We need printed directions but we need something else. It is a matter of training. We don't teach arithmetic by reading directions. We are taught methods and given practice in using them.

Mr. Baker: What would you suggest in the rural school system where it is compulsory to have a chart, with no effort on the part of the teacher to use it?

Miss Smith: I think that is unfortunate. You see, in general, even those of us who are supposed to be trained in education and health lines, have not fully appreciated the psychology of this. We thought if we handed out a chart and printed directions, that would do; but we have to get over that idea. I think at teachers' institutes some effort could be made to give help in vision testing. County superintendents should be able to give individual help as they do in other methods. Ought we not be able to look toward the time when in the teachers' training institutions there is training and practice in this inspection, as in other parts of the program.

It should not be an extra for the nurse or the teacher, but a planned part of her work with time allowed for it.

I know how unsatisfactory correction is in many communities. I know it is impossible in some communities. When the teacher suspects a vision handicap, either poor vision or eyestrain, if she has any feeling at all she will handle the child more wisely and therefore probably avoid a mental difficulty.

The child with no success in spite of effort is not a child who develops good concentration. Good eye health—or the lack of it—may have much to do with the development of mental health or ill health.

I do think in the rural school there should be an effort toward teaching the necessity of placing the chart in the best spot. If you depend on the wall surface for hanging your chart, you may or may not have the best light that is available in that room. With a rack you can set the chart in the position in which it gets the best light the room affords. You may not have twenty feet (and I understand that if you must sacrifice distance or light, it is better to sacrifice distance) then you could work at fifteen feet and your normal reading would be 15/15.

I have always been in general public health work and when I was asked to come into a special field I rather wondered if I would be interested in confining so much of my attention to one phase. I can assure you I am not only interested, but I am having a very hard time to keep up with that one phase. I am not in a special field, I find. I am still in general public health work helping others as I may to fit eye work into the general public health program. This one phase, eye health, means prenatal, delivery, postnatal, preschool, school and adult care. You and I need better to appreciate the practical fundamental things in eye health in order that we may recognize our opportunities and the things that can be put into practice.

CHAIRMAN VAN CLEVE: We shall now proceed to the second subject of the morning, "Eye Health Habit Education," which was to be presented by Miss Maude A. Brown, Director, Bureau of Cooperative School Health Service, University Extension Division, University of Kansas, Lawrence, Kansas. Miss Brown was for five years at Fargo demonstrator in health education and developed into an expert in this field of activity. She has written extensively on this subject and is now doing extension work for the University of Kansas. She telegraphs that her work has so piled up that it is impossible for her to get home from the field and from that point to this place in time for the presentation of her paper, but Dr. Royer has been drafted to present the paper which she prepared.

DR. B. FRANKLIN ROYER: I had three telegrams in the last two days from Miss Brown, so I know her heart is with us. Her presentation covers the question of "Eye Health Habit Education." In preparing this paper she was asked to dwell particularly on the eye health habits of the little folks because it was planned at this afternoon's program Miss Rood would discuss the question more in detail concerning the older age groups where more of the facts might be combined in the hygiene lessons so that the child had a better understanding of the why and wherefore of some of the things in health education.

Teaching Eye Hygiene in the Class Room

Miss Maude A. Brown
Director, Bureau of Co-operative School Health Service, University Extension Division, University of Kansas, Lawrence, Kansas

Hygiene, whether of eye, mind, morals or stomach, is the most difficult of all subjects because it must be successfully taught long years before the pupil is old enough to understand any reasons for the essential health behavior. The child is lost, whether as to morals or as to eyes, if he has been following incorrect practices until he can understand the whys of the correct ones.

The young school child should never have to think of his eyes. The same authority that claps him at six within the four walls of the school room must at the same time undertake not to injure him in the process. The sudden increase in cases of defective vision between the first and second years of school in one year in one small city is doubtless not atypical if the data were collected generally.

Hygiene, whether of eye, stomach, mind or morals, is a laboratory subject. It cannot be taught by precept. The laboratory phase of hygiene in this case differs from the laboratory work in connection with the anatomy of the eye or its physiology, both of which are matters of dissection and refraction, and specific reactions to specific stimuli.

Eye hygiene for children is a matter of windows, their location, size and direction; of window shades and their frequent and careful adjustment; of seating with reference to direction of light and to the size and topography of the pupil in the seat; of blackboards whether black, and of chalk, whether white; of little black marks on white paper which so suddenly have assumed such an overwhelming importance in the child's life; of white tracings on blackboards which must be as carefully considered from the back row of seats as well as from the front.

It is, moreover, a matter of chalk dust and floor dust in the air, of dirty door knobs and desks and, therefore, dirty fingers which seek tired eyes. It is a matter of fatigue not only from specific strains but as a part of the general poor muscle tone. It is, in fact, a matter of general nutrition and therefore of diet, sunshine, play and sleep.

The teacher who teaches eye hygiene must teach these facts. She should refuse to teach any fact that the child is prevented by his school surroundings from applying. It is a poor patriotism that is taught by impressing upon children that certain unattainable conditions are absolutely essential to good eyesight and thereby calling their attention to the fact that their community is forcing defective eyesight upon them. The first fact to be impressed upon the teacher of eye hygiene is, therefore, not to teach it unless her classroom can be a laboratory for the practice of eye health.

Ideally, the young child should learn correct habits of behavior of every sort unconsciously through the natural response to a normal environment. It is, however, only in school that this condition can be insured. Because most homes deny him these essentials of health environment in greater or less degree, the teacher must from her first day's contact with the child and increasingly begin to arm him for the artificial conflict which he must wage against his environment. The primary teacher does this by first supplying him with conditions insuring proper eye hygiene, and second, calling his attention to these essentials by frequent casual reference many times during the day. Third, she leads him to form judgments as to home conditions with reference to eye health and consciously to adjust his own behavior where adjustment is necessary as all too frequently it is.

The teacher of the primary grades has the ideal opportunity since mostly the life at school begins with projects of home life. In some way or other there is a play house, the building and furnishing of which form a completely adequate vehicle for carrying into the home the health precepts of the school. Playing house at school and playing school at home are the two prime favorites of the little folks which afford the watchful mother and teacher all too accurate pictures each of the other's personality and environment. Caring for doll families at school should, if the teacher is of average ability, involve all necessary emphasis of eye and other hygiene, and give the teacher the needed insight into specific needs of emphasis to carry over into different homes.

Another aspect of the scientific teaching of eye hygiene is one which is the source of some of the greatest difficulties in the teacher's path. Glasses cost money. Children cannot be taught eye health who suffer from eyestrain. While suffering from eyestrain, the payments on the automobile must be made—glasses can wait. The earnestness of the faithful teacher and of the visiting nurse combined cannot weigh against the price of gas. Children are sometimes put into painful situations and choose the best way out that their experience furnishes. Joe, for example, was not allowed to play on the team because he needed glasses. The match game was approaching. One morning glasses appeared upon Joe's nose—ordinary brown rimmed ones—like teacher's own that she had misplaced that morning. Joe made the team. The team won. Not until the next Sunday did the coincidence of the sudden reappearance of her lost glasses and the total and permanent loss of Joe's new ones dawn upon her. A plan for the supplying of glasses for indigent children is an essential prerequisite of any instruction in eye hygiene.

If the conscious application of precepts of eye hygiene to classrooms and home situations be faithfully adhered to, by the later years of elementary school life—the fifth or sixth—the actual mechanism of the eye may be studied, using their familiar kodak as the point of departure. From now on, the purpose of the teacher is to rationalize the observances of eye hygiene, begun as unconscious adjustments to correct environment, later consciously considered and carried over into a less favorable outside environment. Now, as rapidly as his developing ability and store of general information will permit, the pupil must be led to understand and plan for these essentials which he has taken on the authority of the teacher. Any intelligent boy or girl of the intermediate grades can learn to take good pictures with kodak or camera. Many essentials of eye hygiene can be illustrated and made clear in the reasons for success or failure in picture making.

With the junior high school the public health point of view appears, and the pupils find interesting and useful laboratory work in the survey of school buildings. Conditions affecting eye health are noted, tabulated and reported upon and recommendations made. A foot-candle meter can be borrowed from the light and power company in the larger cities, and this adds tremendously to the interest of the students and to the usability of their findings. The educational value of the project is greatly enhanced if, after study of this instrument, the students make one of their own. A shoe box, a hole through which runs a rod bearing at the end inside a small bulb, two paraffine covered windows, and you have the equivalent of an expensive instrument, the distance of the bulb from the window taking the place for measurement of the row of windows of graduated thickness. The value of the project depends, of course, on the teaching power of the teacher. If it is made a serious problem of, say, the high school physics class and the home made instrument calibrated by comparison with the commercial one and actually used in the survey, its value is difficult to over-emphasize.

The hygrometer made in the laboratory is vastly more interesting than the pattern, and should be just as accurate in the survey of schoolroom air conditions and their relation to eye inflammations. A very direct relation between the incidence of conjunctivitis and dust was observed in one school system in the rooms cleaned by vacuum and those dry swept.

With the last years of high school comes the technical study of light and of human biology, which, if the work of the earlier years has been well done, puts the rationalizing seal of "Pure Science," upon performance already habitual.

In summarizing, the course of the teaching of eye hygiene in the schools may be traced as follows:

(1) Unconscious response to a safeguarded environment.

(2) Consciousness of these essentials carried over into life outside the school.

(3) Beginning of rationalizing these performances now habitual.

(4) Public health aspects emphasized in junior high school, in general survey of health conditions of school plants.

(5) Further rationalizing of practices of eye hygiene now habitual, in the study of the "Pure Science" in high school.

Discussion

CHAIRMAN VAN CLEVE: This practical paper and the demonstration by Miss Smith are now open for discussion. Miss Anna Heisler, Professor of Public Health Nursing, Washington University, St. Louis, will open the discussion.

MISS ANNA HEISLER, Professor of Public Health Nursing, Washington University, St. Louis, Missouri: I am glad to have this opportunity to tell you how I welcome Miss Smith's work. I was county nurse, too, and really my ignorance of the technique of vision testing when I went into the rural schools was equal only, I think, to my ignorance in driving a Ford car. How I ever escaped death, and how the people on the road ever escaped being killed when I was on the road, I don't know. It was positively criminal to turn me loose with a Ford car and with an eye chart when I went into the county ten years ago.

Now, I really think the National Society for the Prevention of Blindness has done a great thing for our work in public health nursing and, of course, ultimately, for the child; and, after all, it is the child that we are working for in developing this technique of testing the vision of children. I haven't any idea how many thousands of children I worked with, and how many vision tests I gave when I was working in rural Missouri, but I did develop something of a technique for myself. It used to worry me terribly, when I was a state nurse, to see how slipshod the vision-testing methods of some of the rural nurses were, and I used to make suggestions to them which they did not take very readily. Miss Smith's method is 100 per cent,—200 per cent better than the technique I developed for myself.

I remember one thing that we did. We had a little pointer made by a cabinet maker. It was black. We had it painted black with a red point, if I remember correctly. The pointer was about a foot and a half long, and we had the red point so that it would stand out distinctly from the letters. I always trained a high school girl to assist me in a town or city school, or one of the older children in a rural school, so that she would point very accurately to the letter I wished the child to see. This cover that the National Society has worked out so that only the letter to be interested in at the moment is seen, is infinitely better because then there can be no confusion. The child knows definitely what you want him to do. The very fact that such careful instruction is given so that you make sure the child knows what it is all about, it seems to me, is a thing highly worth while.

Of course, as Miss Smith has already said, the time element does enter in, and a public health nurse does not have time to give so much individual help to each child. But if we consider the ultimate gain in time expended in that way, and the great value to the child (even if we discover only one in twenty or one in forty who really needs decided correction), it is worth while.

I, too, had an experience similar to that of Miss Smith. I, too, taught school before I went into nursing. In those old days the teacher was not supposed to know anything at all about the child except that he had a mind and that mind was to be developed. He was not supposed to have a body. That was something beneath the teacher's notice, a thing with which we were not concerned.

I think until I was twenty-five years old I did not know that there was such a thing as the physical body. It just did not come into my mind at all. I was so well and healthy that I was not aware of my body. I was not aware of having feet, teeth or eyes, or any other organs that might need special attention. My feet walked automatically; I did not have to think about them. I supposed everybody else was in the same situation. I did not realize for a long time that perhaps some people could not see so well as I could, and might need some attention to their eyes. Just in the last ten years or so the teachers are beginning to know that the physical condition of the child may have something to do with his ability to develop intellectually.

Now Miss Smith is introducing another thing even in connection with such a thing as eye testing, and that is the psychological attitude of the child toward all these things that concern him; and, of course, more and more the public health nurses and all the people who are interested in the development of the child are becoming interested in mental health as well as physical, his attitude toward his teacher, his fellow students, his family, and all the rest of his associates. I am so glad she went into that matter along with the other things that she discussed.

I have not associated with teachers lately, so I do not know how far along they are in this matter of mental hygiene, whether they are thinking about it or talking about it, or whether they know there is such a thing. I regret that, so far, in Missouri, this vision testing demonstration has not been given to every teacher. I wish there were some ways for us to have this method of vision testing presented to every teacher in the state. Of course, the ideal way would be through the teachers' colleges and all the institutions throughout the country that are training teachers. I wish they all knew the technique and could be carefully supervised in the use of this method until they really could do the vision testing properly.

In some states, of course, the normal schools are giving a very thorough course in general child hygiene to the teachers. In Virginia there is a law which makes it compulsory for every teacher to have such training.

I hope this eye health work, along with other things that will help the child, will eventually get into our normal schools so that all the teachers may be taught those things. Of course, I am perfectly delighted, at the beginning of our course in public health nursing, for my students to see the correct technique of vision testing, and to learn the other things that they need to think about in connection with that.

I was interested in Miss Brown's paper read by Dr. Royer, particularly the part which dealt with the school environment as it pertains to eye health. Would that school boards and teachers of rural schools might know even some of the things to be taken into consideration to give the children the correct environment.

Unless things have changed considerably in the last five years since I have been away, I am sure there are rural schools in Missouri where the walls are painted a dark gray, with light coming from both sides and the rear, and sometimes even from the front of the building. That sort of thing did exist in Missouri some years ago. If this instruction also were given in normal schools, the teachers could confer with the school boards and help them plan for the changes needed in these schools to secure the proper environment.

I think perhaps the National Society for the Prevention of Blindness may have some specific information that can be given to the normal schools concerning light and the painting of walls; and I know it is doing its part to get that information generally disseminated. But the thing I deplore is that not all of them are standing with open arms to welcome the information which is available to them. Sometimes teachers and the rest of us do not know the sources from which help is available. I know when I was a country teacher, and when I was a rural nurse, there were times when I labored under that difficulty. I think all of us here, and your leaders in your own communities, should help the National Society, the State Commission, the State Board of Health, and all the other agencies interested in eye health, in all their efforts toward prevention of blindness and promotion of eye health. All of us should make every effort to let the people in the remotest corners of the state know of the availability of these helps, and I hope all of you will make just as extensive use of Miss Smith as you possibly can, and tell everybody else about her work so that the teachers and the public health nurses of every community can have the technique properly taught.

I may be over-enthusiastic, but I don't believe I am. I welcome the opportunity that the National Society is giving us to learn about some of these things; and I am so glad, too, that Miss Smith ties up all these things pertaining to eye hygiene with the general public health program. It was really gratifying to me the other day when Dr. Stewart talked here to see that this matter of eye health and prevention of blindness is being carried right along with the general public health program as an essential part of it.

Of course, sometimes people say, "Everybody is doing that; we don't have to talk about it." We take it for granted here in Missouri, because blindness has been a big problem with us. Ever since I have been in public health work, we have been talking about eyes, and I myself have taken it for granted, I suppose, that everybody else should be interested in eye problems too.

The really valuable thing the National Society does for us, and for those of us who are here this morning, is that Miss Smith in her work does sensitize (that is a word I got last year at the National meeting) the public health nurse, and the other public health workers, and the teachers to the need for putting some special attention on eyes, along with the other health work they are doing.

CHAIRMAN VAN CLEVE: Thank you, Professor Heisler, for this very pertinent discussion.

I now call on Miss Pearl McIver, Director, Public Health Nursing, Division of Child Hygiene, Missouri Board of Health, Jefferson City, Missouri.

MISS PEARL MCIVER, Director, Public Health Nursing, Missouri Board of Health, Jefferson City, Missouri: Miss Heisler and I worked together for so long that our thoughts just naturally work along the same channel, and she said nearly everything I expected to say about the two papers that were given this morning.

I thought one little statement in Miss Brown's paper very pertinent: "It is a poor patriotism that is taught by impressing upon children that certain unattainable conditions are absolutely essential to good eyesight, and thereby calling their attention to the fact that their community is forcing defective eyesight upon them." Then, the next statement, "The young child should learn correct habits of behavior of every sort unconsciously through the natural response to a safeguarded environment," shows how difficult it is to teach eye health habits because frequently the environment is not safeguarded.

That, of course, is the foundation of all health habit training. Naturally, I am more interested in the rural child, and everything that has been said I have been turning over in my mind in connection with rural health work. Those statements bring home to us the fact that it is very difficult to teach eye health habits in many of our rural schools because, I am sorry to say, they are still very defective as far as construction, lighting, and everything of that sort. It takes a very ingenious teacher to be able to so arrange her room that she gets half way decent lighting.

I have been in a school building that has windows on four sides. Proper shades are not provided. The teacher has to get heavy paper or makeshift shades to cover the windows, and sometimes she is not able to get enough light from the ones that are left. That is a fact that we must keep in mind when we are teaching health habits. There is no use in teaching about health unless we are making conditions possible for the children to practice those things we are teaching them. Sometimes the ingenious teacher can improvise and make over a little rural school that is lighted very poorly so that it might be acceptable, and that should be her first consideration.

As to cleanliness, I was impressed with the point Miss Brown made about dirty hands and rubbing them in the eyes. Tired eyes will be rubbed. I do it myself frequently. Most schools have no facilities for washing the hands. We tried to overcome that by establishing the habit of washing the hands before eating, as that is one of the fundamentals of health hygiene.

I am sure most of you are familiar with the hand washing instructions. We do have a little technique by which twenty or thirty children can have their hands washed without any equipment in five minutes' time. I am glad to say that in most of the counties where we have health workers in the rural schools, that procedure is being carried out. Most of the schools in the other counties provide nothing more than a tin basin and a bucket.

I am glad to report that our chief sanitary engineer is working on a project now which we hope he will have ready within the next few months, an attachment for the rural schools whereby they can readily have a sanitary drinking fountain and hand washing facilities attached to the pump. When one child pumps two or three can be getting a drink from really sanitary fountains with a stream of water coming from the right direction, and there will be hand washing facilities going on at the same time. When we get that developed we think that it will be a big improvement.

One important thing with respect to eye health is general fatigue. Most of the rural schools still have a pretty hard and fast rule of one recess at ten-thirty or ten-fifteen, and no recreation in between. We are encouraging the rural teachers, and especially those who have victrolas or phonographs in their schools, and a good many of them have, to stop every hour perhaps for five minutes of exercise, throw open the windows and have a little physical relaxation. I think that has a big influence on their eye health, too.

I think the point Miss Heisler made about teachers being trained to recognize symptoms of eye strain is very important. The nurse in our rural districts—of course, I am still talking about rural conditions—does not get to school but once or twice a year. She can, of course, make the more detailed inspection and help the teacher, but the teacher who is there five days in the week for every week in the school year is the one who should recognize the symptoms of eye strain and be on the alert to report those conditions.

CHAIRMAN VAN CLEVE: Questions are in order, of course. Are there any questions that you would like to put to Miss Smith or to either of the discussants?

This is a subject of live and present day interest. I was also quite pleased with that remark concerning rubbing the eyes with dirty hands which I heard in the paper, and the discussant, too, thought it worth while to call attention to it. I used to make it a rule to answer those who said anything to me about the matter of rubbing the eyes! It is quite all right to rub your eyes. Rub them as hard as you please. Pay no attention to the people who are telling you you must not touch your eyes. The thing is that you must be careful to rub them only with your elbows.

Dr. Jackson is here. I wonder if he will not make a contribution to this discussion. Dr. Edward Jackson, of Denver, whom I think you all know.

DR. EDWARD JACKSON, Denver, Colorado: I think the outstanding achievement of the Society for the Prevention of Blindness, in putting Mrs. Royer and Miss Smith in the field, has been the simplification of the testing, which seemed to be too difficult for even the ophthalmologists to undertake until it was demonstrated to them that it could be done.

As to the lighting of rural schools—good light can be obtained in practically all rural schools, but it can only be obtained by those who understand what is good light.

You have to use your imagination, and I suppose you would have to use your imagination anyhow under the circumstances. You perceive that strong light comes in from this window; if you bring something close enough to the window that light would probably be equal to the outdoor light from the sky, which is the best sort of illumination we can get anywhere; but the farther you go away and in direct relation to the direction that you go from the window, the less adequate becomes the light that you get.

The glare, which is the phase that is attached to bright lights particularly, is chiefly a matter of regular reflection from the surface of the thing looked at. So, if you can put that test close enough to the window you will have enough light; and if you have the light coming in obliquely with the child in front of you, he will be rid of the glare. The regular reflection will go on the floor, or off across the room. It will not be on the child at all. With that kind of illumination it is possible for the teacher or the nurse who wishes to apply these tests, to do so practically in any school. That is one simplification.

There is another instance, with reference to the apparatus. We ought to be particularly grateful for the distance the tests have been carried as to what apparatus is necessary and the best arrangements for it; such as this apparatus Miss Smith has brought before us this morning. There is a possibility of still greater simplification. I want to remind you that this is the Snellen card, what we call the Snellen E, because we have no better name for it. That was arrived at by Professor Snellen within a year or so after he introduced his test cards, after the first Snellen cards were published. He began with not quite this form, but with another form of a figure that was turned in different directions and constituted the test; and these are turned in different directions and constitute the test of vision. That has been more than sixty years ago. But still the ophthalmologists of the world have never appreciated what was essentially the test and how to simplify it. I hope Miss Smith, or somebody else, will keep at it until every one does.

The essential thing is that it is exactly the same figure, turned in different directions. That can be simplified. We don't have to go back to our card of test letters at all; but we can take this card and cut it up. You can make four different tests, which can be distributed among four rural schools, out of this line. Cutting one of these figures from each of the lines you have a separate test. That can be pasted on a card that is large enough, which leaves you only one object to look at and does away with the need of having a window and the black card in front.

One thing that is worth bringing up again is with reference to Miss Brown's paper about health habits. This is an idea that ophthalmologists working with eyes all the time have appreciated more than have the mothers, teachers, or perhaps even the school nurses. It is that a young child with a short arm can't hold anything a yard away, or half a yard away, from his eyes; or even a foot from his eyes, very often. If he wants to see accurately, and if the mind is intent on what the eyes are doing, he has to hold it close; and with everything, in school or in kindergarten, he has developed a fixed habit of holding things close to the eyes.

We know that children have such an excess of focusing power that they can freely move things in front of their eyes; but they do have another habit that is just as completely fixed by the time they come to school. When the eyes get tired they dislike looking, and they stop. The revolution that comes into every child's life when he goes into school is not to stop doing what he is doing, whenever he feels like it; but the doing something continuously for an ultimate result.

So the first thing to be taught in the school, with reference to health habits, is the teaching of a child to look at things farther away. Miss Smith gave a very good lesson in every child she tested this morning, in having them look at things close and then learn to look at them farther away. That is perhaps the first thing to be taught. While the child is learning to hold things farther away, the teacher may be learning that the brevity of the exercise will determine how interested the child is, how capable the child is in learning the test, and the other things which should be taught. When the eyes get a little tired, close them and give them a rest.

That the child is not capable of prolonged exercise, and that the child has already established a habit of holding things close to the eyes, are the two things to be brought out; and made the basis in the first teaching of health habits with reference to vision.

Chairman Van Cleve: Thank you, Dr. Jackson, for your approval of our work. We very much appreciate the presence of distinguished ophthalmologists. I was much interested and pleased to hear from these discussants their confessions, and in the papers of the stories of persons who acknowledge their ignorance. It has been said that of him who knows nothing and knows that he knows nothing, there is hope. Miss McIver, monumental ignorance about lighting conditions is not confined at all to the rural school boards. Three directors of the National Society for the Prevention of Blindness were together at an educational conference and they walked into the library of one of the great universities of this country. Instantly they saw that there was violated one of the principles of lighting that any architect ought to know. It is the function of this National Society for the Prevention of Blindness to find experts who will tell the other experts what they ought to know, and the intelligent expert is always glad to be informed.

Dr. B. Franklin Royer: In concluding my discussion of the paper I read for Miss Brown, I want to relate a personal incident that applies to the problem of health education. In a sight-saving class demonstration school last summer I saw a lesson that I want to relate to you. I sat as an observer in a room that was properly decorated with a near-white ceiling, buff side walls, with thin buff translucent shades at the windows, and with loose adjustable desks with tilt tops. While I sat with the observing teachers in the back row, a huge black cloud went by and the light dropped down until the room was very noticeably darkened.

That teacher had apparently been working on the plan of a pupil assignment of "officer of the day." A little child whom I judged to be "health officer," not more than eleven years in appearance, who was free to circulate around the room, walked over to one of the desks and said something to a little seated child who got up and they both took hold of the desk and re-oriented it a little bit. The eleven-year officer of the day adjusted one of the shades, then quietly stepped over and said something to the teacher. The teacher's reply was not heard but apparently contained some suggestion about the roller shades. The officer of the day returned to the window again adjusting the shade, then looked at the teacher who shook her head. The child health officer was right in the first arrangement. Was she not learning a real lesson in eye health habits? I can imagine that little child health officer when mother was sewing or reading at home suggesting to mother some readjustment of the light in the home, thus carrying the lesson back into the home as brought out by Miss Brown in her paper. I can imagine that little child health officer with younger or older brothers or sisters at play or while at home working making similar lighting adjustments. That is a real practical eye health education.

Chairman Van Cleve: Dr. Benedict, won't you give us a few words?

Dr. Benedict: I want to take this opportunity to express my appreciation of the difficulties encountered by teachers in attempting to determine the visual acuity and visual defects of school children. Several years ago I taught in the rural schools of Indiana and have had personal experience with the teacher's difficulties. A former speaker has stated that it is only in the past few years that teachers have been confronted with the necessity of determining the visual acuity of school children. My teaching experience antedates this period. Twenty-five years ago the rural schools were not supplied with means for testing visual acuity according to the standards that are now in common use by school doctors and school nurses. There were, however, attempts made to compare the eyesight of school children, one against another, by the use of familiar objects such as apples, leaves and other objects thoroughly familiar to country children. While, in all probability, small disturbances of vision were not detected, yet it must be said that teachers give considerable thought to the protection of the eyes of children and utilize every available means for providing suitable illumination for the rooms.

The problem of providing proper conditions for children with visual defects were the same then as now. The means for taking care of the children with deficient eyesight have not improved very much even yet in the rural schools. During the past ten years standard methods of examination of the visual acuity of school children have made it possible for teachers to place children in advantageous positions in the room on a more intelligent basis of classification. Rarely, however, do we find teachers sufficiently informed regarding the needs of the eyes of school children to make it possible to carry out any systematic sight-saving plan.

It should be borne in mind that the laboratory standards from which our visual test cards are constructed, should be applied with some knowledge of their limitations. School teachers and school nurses should have instructions in the methods of testing eyes before being asked to apply any remedies to better the conditions of the children in the school room.

Chairman Van Cleve: Thank you, Dr. Benedict.

We adopted as the slogan of the National Society fifteen years ago the words, "For the Conservation of Vision." This morning we have learned that in the program of every health nurse perhaps the first and most obvious thing to do is this testing of the eyes of little children. We have progressed a good deal since we started this morning with the little ones. We have been talking about vision testing for older folks, particularly those in the public schools. We have discussed, also, lighting problems which have to do very materially with the health of children's eyes.

If there is any other phase of this subject that will interest you, will you make a contribution? If not, I will call on Miss Smith to close the session with any further remarks she wishes to make.

Miss Smith: I think there are no further remarks. I am glad to have an opportunity to say thank you to you all because there have been contributions which have meant a good deal to me, and I am very happy to have them to pass on to others. I am glad Mr. Van Cleve spoke of the various ages discussed. Although in the demonstration we used little children—we do wish to urge attention to the little child—yet some of the principles discussed are principles which will make for accurate testing in any age. I think it has been helpful to all of us to think in terms of positive hygiene, the hygiene of environment, and the development of good habits. The majority of children come into life with possibilities of developing normal vision. We wish to give them the opportunity for developing and maintaining normalcy. Added to that positive health program is the inspection which will bring to the front those children who seem to vary from the normal. We hope by pointing out these suspected handicaps to in time improve opportunities for correction of those individuals. Bringing eye hygiene into the general health program becomes an essential as we better appreciate the inter-relationship of functions, the effect of one part of the body upon the whole. A specialty within the field of health can only contribute a part of that hoped for result in the welfare of children which we term health. With each contribution is assured to the child a greater possibility for a life of service and happiness.

Chairman Van Cleve: This is the snappiest meeting we have had since I have been here. Here we are almost at the close of the conference and there is pep to spare.

ROUND-TABLE LUNCHEON CONFERENCE ON SIGHT-SAVING CLASS METHODS IN ST. LOUIS

MRS. HAZEL C. MCINTIRE, Chairman

Editor's Note.—This section is published separately as an issue of the *Sight-Saving Class Exchange*, No. 28, December, 1929, and can be secured from the National Society for the Prevention of Blindness upon request.

Round-Table Luncheon Conference on the Public Health Nurse in Relation to Vision Testing

Miss Pearl McIver, R.N., Chairman

Editor's Note.—Because of the informality of this luncheon meeting, the National Society for the Prevention of Blindness in the interests of economy is omitting its publication in this volume. A general discussion on the part of a group of public health nurses was led by Miss Isabelle Carruthers, R.N., of St. Louis, Missouri.

The National Society for the Prevention of Blindness has in its files a complete verbatim description of every meeting and will be glad to extend the courtesy of reviewing its transcript to any one interested.

SIGHT-SAVING CLASS OPPORTUNITIES

MISS ESTELLA LAWES, Chairman

Editor's Note.—This section is published separately as an issue of the *Sight-Saving Class Exchange*, No. 28, December, 1929, and can be secured from the National Society for the Prevention of Blindness upon request.

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* Deceased, March 8, 1930.